THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

While the activity is more marked in some districts and in some lines than in others, the week has added to the strength of the situation, both in steel-making and foundry pig irons. There has been no purchase of April iron by the Steel Corporation, but its requirements are expected to be nearly as large as in March, for which month 40,000 tons was taken from merchant furnaces. Indications now are that all the Bessemer iron that can be supplied by merchant furnaces to the middle of the year will be taken up by the steel companies. For the present the $15.50 price for Bessemer at Valley furnaces holds, but the tendency is upward. In foundry iron there has been a renewed buying movement in the past few days, after a slight lull following the activity of the first week of the month. Eastern foundrymen have been conspicuous as buyers, New York and Philadelphia representatives of Northern furnaces having booked fully 75,000 tons, at prices showing some irregularity but in general an advance of 25 cents for the week. Southern iron can still be had at $13.50 at furnace in large lots, but $13.75 is now asked again by interests that had previously tried to establish it but had gone back to $13.50.

The advance in coke is a factor in all calculations of furnacemen for the second half. Connellsville furnace coke has reached $2.40 in contracts for the second six months, as against $1.60 and $1.65 and in a few cases as low as $1.50 for the first half. This sharp increase in fuel cost has led to the withdrawal to a very large extent in the past week of quotations below $16 at Central Western furnace for No. 2 foundry iron. The February blast furnace record showed that with production reduced by cold and snow—and consumption also reduced for like reasons—merchant stocks were cut down about 25,000 tons. Production is now on a larger scale than in February or even January, but there are also signs of expansion in consumption. The foundry trade, which has lagged, is quickening its pace and is reinforcing the general market at a time when the disparity between steel and foundry lines, was causing question. Buyers in Central territory are not hurried under cover by the talk of advances in Southern irons, in view of the existing difference between Northern and Southern pig in districts close to Northern furnaces. But higher coke and ore and the prospect of higher labor is undoubtedly giving a firmer tone to the Northern market. A purchase of 15,000 tons of Southern iron by a cast iron pipe interest was on a basis slightly below $13.50 for No. 2, and that price was shaded in the recent buying for electrical works in the Pittsburg district. Firmer ground has been taken in the week by producers of basic iron. Bessemer iron has not shared the advances in steel. Sellers are conservative in view of the refusal of the Steel Corporation to pay their $16 price in January, but are now more disposed to take a firm stand.

The condition of the steel market is evidenced by a purchase of 1,000 tons of open-hearth billets by the leading interest in the Chicago district. Higher premiums might be had, but makers are maintaining these at $3 to $3.50 above association prices. Rods have advanced $1 to $2. The railroads have placed more rail tonnage. The South Chicago mill, with a contract of 30,000 tons last week, has about 600,000 tons on its books, including what was carried over from 1904, and is practically out of the market.

The poor shipping record of the plate mills in February has set them farther behind and the congestion in this line promises to be heard from more and more. The Chicago mill is 60 to 90 days behind. Structural mills are putting more business on their books weekly than they are able to ship. A Pittsburg mill closed 15,000 tons that will go into the reinforcing of 125 railroad bridges. The American Bridge Co. has closed 7,000 of the 23,000 tons of steel work that will be required by projected manufacturing extensions. Chicago reports 3,000 tons of shapes closed, with bids asked on a project calling for 8,000 to 10,000 tons. In general the building prospect is growing.

The anticipated advance in light sheets is not yet announced, and independent sheet mills are chary of selling meantime. The probability of an advance in tinplate and in wire products is also a factor in current business in those lines. Wrought pipe mills are booking business at a greater rate this month than in January and February. Steel bar mills are making record shipments, but it is to be considered that a large tonnage is just now going into jobbers' warehouses, and shipments are not equivalent to consumption. The same observation applies to a degree also in the case of sheets, tinplates, shapes, plates and wire goods.

PITTSBURG.

OFFICE OF *The Iron Trade Review*, 429 PARK BUILDING, March 15.

After several weeks of unusual activity, the pig iron market has again settled down to more normal conditions. The buying on the part of the foundry interests is more widely diffused indicating that this branch of the iron industry in this district is at last feeling the affect of improved conditions in the iron and steel trade. While it is still possible to shade $16, Valley furnace, for No. 2, on large tonnages, carload orders cannot be placed below this price, and a few operators are asking $18.50. At the meeting of the Bessemer Furnace Association, held in Cleveland last Saturday, it was decided to hold both Bessemer and basic at a minimum of $15.50, furnace, although this price on basic can be shaded. The Steel Corporation is taking the iron on its last order as fast as it can be produced and at the present rate all shipments will have been completed within a week. It is reported, but not confirmed, that about 10,000 tons will be required for delivery this month in addition to the original purchase and that 30,000 tons is the estimate of requirements for April. If these purchases are made, the situation in the Valleys will be greatly strengthened, and better prices are looked for.

Furnace coke for delivery the second half is already

commanding $2.40 to $2.45, and in one instance as high as $2.50 was paid. This represents an advance of fully 75 cents a ton over the average price paid for delivery in the first half of the year, and some of the furnaces closed for the six months' requirements as low as $1.50. Furthermore there is some discussion of an advance in the wages of the blast furnace workers on April 1, as they are again demanding an 8-hour day, and are likely to make the customary compromise. Pig iron manufacturing costs are thus being gradually advanced and with the higher priced ore of 1905 after May 1, the cost of producing iron will have advanced fully $2 a ton.

The Riter-Conley Mfg. Co., this week received the order for the reconstruction of 125 bridges on the West Shore branch of the New York Central railroad. About 15,000 tons of structural steel will be required, the contract for which has been awarded the Carnegie Steel Co. There is not let up in other lines of finished material. The spring demand for merchant pipe has already set in and the tonnage that will be placed this month already promises to exceed either January or February. An advance of $2 a ton in sheets is expected daily, while the movement of nails and wire products is heavier now than at any previous time this year. No advance has yet been made in tin plate, although it would not be surprising if such an announcement is made when the sheet advance comes.

Pig Iron.—The Westinghouse business placed last week brought out lower prices than anticipated, all of the Northern iron being sold below $16, Valley furnace, while on the Southern iron the $13.50, Birmingham basis, for No. 2 was shaded. None of the small lots of foundry iron that are offered the Valley producers are now being taken below $16, but this would no doubt be shaded on a desirable tonnage. On Bessemer $15.50 is now the minimum, although as low as $15.25 could be done on basic. Some of the Southern producers are holding No. 2 at $13.75, Birmingham, but iron is still offered at $13.50. As there is little doubt that the Steel Corporation will continue to buy Bessemer from Valley furnaces for several months, there are indications that the Valley situation will be considerably strengthened. We make the following quotations:

Bessemer, Valley	$15 50
Bessemer, Pittsburg	16 35
No. 1 Foundry	$17 00 to 17 25
No. 2 Foundry	16 60 to 16 85
Gray forge, Pittsburg	15 75 to 15 85
Basic, Valley	15 25 to 15 35
Basic, Pittsburg	16 10 to 16 20

Steel.—Steel mills are not inclined to advance premiums over what have been prevailing and for delivery the second half of the year both Bessemer and open-hearth billets can be had for $23, f. o. b. mill, Pittsburg. On sheet bars for this delivery $24.50 to $25 is asked, while for spot shipment billets are quoted at $24.50 to $25, and sheet bars at $26 to $26.50. Bessemer and open-hearth rods are held at $33 to $34.

Ferro-Manganese.—Steel casting plants in this district have been buying heavily, and most of their requirements have been covered by imported material on the basis of $44.50 Pittsburg, although it is doubtful if better than $45 could be done now on 80 percent ferro, the English makers having made a slight advance. Domestic is held at $46, and the producers are not offering large tonnages.

Muck Bar.—There is practically no muck iron moving and it continues to be held nominally at $28.50 to $29 Pittsburg.

Skelp.—We note the sale of a round tonnage of sheared iron skelp at 1.85c Pittsburg, and grooved at 1.67½c. Grooved steel is held at 1.50c to 1.55c, and sheared at 1.60c to 1.65c.

Rails and Track Material.—Slightly better prices are realized for light rails, but they are still being sold below the price of standard sections. Splice bars for standard sections are quoted at 1.25c, but bars for light sections are held considerably above this price, according to the section. We make the following quotations: Fifty lb. and over 500 tons, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 lb., $26 to $26.50; 20 lb., $25 to $25.50; 25 to 45 lb., $23 to $23.50; Angle bars for standard sections, 1.25c; spikes, 1.75c to 1.80c.

Plates.—Steel car plants continue to specify heavily and an increased tonnage is coming from the boiler makers and tank builders. The new plate producing capacity under construction by the Allegheny Steel & Iron Co. and the LaBelle Iron Works will be available about the middle of the year. We quote: Tank plates, 1¼ in. thick, 6¼ in. to 14 in., inclusive, 1.50c f. o. b. mill Pittsburg; over 14 in. up to 100 in., 1.60c. Extras are as follows per lb.: Flange and boiler steel, 10c; marine, A. B. M. A., and ordinary fire box, 20c; still bottom, 30c; locomotive firebox, 50c; plates over 100 in. up to 110 in. in width, not less than 5c per 100 lb. extra; plates 110 in. to 115 in. wide, not less than 10c extra; 115 to 120 in., 15c extra; plates 120 in. to 125 in. wide, not less than 25c extra; plates 125 in. to 130 in., not less than 50c extra; plates 130 in. wide, not less than $1 extra; plates 3-16 in. thick, $2 extra; gauges 7 and 8, $3 extra; No. 9, $5 extra. Five cents extra for less than carloads. Terms net cash in 30 days, and for all points of delivery in the United States except Pacific Coast.

Bars.—We note the sale of 1,000 tons of iron bars at 1.65c Pittsburg, although the leading producer will not sell below this price Youngstown. Specifications for steel bars continue very heavy. We quote as follows: Bar iron, 1.65c to 1.69¼c Pittsburg; hoops, 1.55c and bands, 1.50c, both taking bar extras. Bessemer steel bars, 1.50c; open-hearth steel bar, 1.50c; plow and cultivator, 1.50c, net; channels, angles, zees and tees, under 3 in., 1.65c. The following differentials are maintained on steel: Less than 2,000 lb. of a size and not less than 1,000 lb., 10 cents advance; less than 1,000 lb. of a size, 30 cents advance.

Structural Material.—The contract for rebuilding 125 bridges for the West Shore road of the New York Central is the largest railroad work awarded for some time. The steel amounting to 15,000 tons will be furnished by the Carnegie Steel Co., and the Riter-Conley Mfg. Co., will do the fitting and erecting. We quote as follows: Beams and channels up to 15 in., 1.60c; over 15 in., 1.70c; angles 3 x 2 up to 6 x 6, 1.60c; zees, 1.50c; tees, 1.65c; angles from 3 to 16 in., 1.60c; universal and sheared plates, 6¼ to 14 in., inclusive, 1.50c; over 14 in., 1.60c base.

Sheets.—An advance of $2 in both black and galvanized sheets is looked for within a few days. None of the independent producers will quote beyond 30 days owing to the uncertainty of the sheet bar market. We make the following quotations, carload lots on black sheets: No. 30, 2.70c; No. 29, 2.60c; No. 28, 2.30c; No. 27, 2.20c; Nos. 25-26, 2.15c; Nos. 23-24, 2.10c; Nos. 18-20, 2.05c; No. 16, 2c; Nos. 12-14, 1.95c; No. 9, 1.90c; No. 8, 1.85c. Galvanized, No. 30, 4.35c; No. 29, 3.85c; No. 28, 3.45c; No 27, 3.25c; Nos. 25-26, 3.05c; Nos. 23-24, 2.85c; Nos. 18-20, 2.70c; No. 16, 2.55c.

Wire and Wire Nails.—The movement of nails and wire products is heavy and promises to increase later this month and during April. Higher prices are looked for. We quote as follows: Wire nails, jobbers' carload lots, $1.80; retailers' carload lots, $1.85, and less than carloads, $1.95; painted barb wire, $1.95 for jobbers in carloads; retailers' carloads, $2 and less than carloads, $2.10, with 30 cents for galvanizing. Annealed smooth fence wire is held at $1.65, with the usual differentials to retailers for carloads and less than carloads. Quotations are all f. o. b. Pittsburg, 60 days, with 2 percent discount for cash in ten

days. Iron cut nails are held at $1.85 Pittsburg, and steel at $1.75.

Pipes and Tubes.—The buying of merchant pipe continues very heavy, the tonnage for this month promising to exceed either January or February. Discounts to consumers, carload lots, f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ inch	67½	51½	65½	49½
⅜ to 6 inches	70½	65½	74	64
⅜ and ½ inch	71½	59½	69½	57½
7 to 12 inches	70½	55½	68	53½
Extra Strong Plain Ends.				
⅛ to ⅜ inch	60½	48½	58½	46½
½ to 4 inches	67½	55½	65½	53½
4½ to 8 inches	63½	51½	61½	49½
Double extra strong plain ends, ½ to 8 inches	57	46	55	44

MERCHANT BOILER TUBES, CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1½ inches	46	42
1¾ to 2½ inches	58	48
2½ inches	60	48
2¾ to 5 inches	66	55
6 to 13 inches	58	43

Less than carloads 2 points less.

Merchant Steel.—There is no let up in the demand for all grades of high grade steel, while shafting producers report the closing of a constantly increasing tonnage. We quote as follows: Cold rolled and ground shafting, 50 percent off in carload lots, and 45 off in less than car lots, delivered in base territory; tire steel, 1.60c to 1.65c; open-hearth spring steel, 2c to 2.10c; sleigh shoe flat, 1.55c to 1.60c; smooth finished machinery steel, 1.60c; toe calk, 1.05c to 2c.

Old Material.—The market is quiet, and transactions are limited almost entirely to small lots. In carloads heavy melting stock can be had as low as $16, although a large tonnage could not be placed below $16.50. We make the following quotations, gross tons: Heavy melting stock, $16 to $16.50; low phosphorus, $19.50 to $20.50; rerolling rails, $16 to $16.50; sheet scrap, $14 to $14.25; No. 1 wrought, $19 to $19.50; cast iron borings, $11 to $11.25.

Coke.—Heavy sales of furnace coke for delivery the second half of the year have already been made on the basis of $2.40 to $2.45 Pittsburg, and in one instance as high as $2.50 was paid. On the average this is fully 75 cents higher than was paid for coke by the furnaces for the first half, and in a few cases these prices are not attractive to the coke producers who are holding out for still higher prices. On foundry coke few producers will quote below $3, and as high as $3.25 is paid for special grades. In the week ending March 4, the shipments from the Connellsville region broke all records, 13,746 cars of coke being sent out. Production also continues at the high point, the upper region producing 256,554 tons during theis period and the lower region, 75,052 tons.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, March 14.

There are no soft spots in this market; neither is there apparent any circumstance liable in the immediate future to have a demoralizing effect on prices. Everything is strong and of an upward tendency. Local interest centers more largely in covering for future requirements than in present needs. Practically the entire demand is for deliveries extending beyond April, and the manner in which this inquiry has broadened in the last few weeks indicates that buyers have ceased waiting for lower prices and are now covering as far ahead as producers will allow. This condition is particularly true of pig iron. Since March 1 contracting for pig iron has increased rapidly, and if the present volume keeps up the tonnage booked this month will exceed that of last November, which was known as a banner month. Intermediate and rolled products differ in no respect from the conditions surrounding pig iron. Mills are unable to meet promptly the demand for either. The shortage of billets is probably the most pronounced in this market, having been of the longest duration. This condition is well illustrated by the purchase last week by the Illinois Steel Co., itself a large producer of this product, of 1,000 tons of open-hearth steel from another local manufacturer for its own requirements. Wire rods have been advanced $2 a ton, or to the basis of $35 Pittsburg, and sales are being restricted to 90 days' deliveries. The difficulty of getting sheet bars, except on payment of high premiums, indicates an advance of at least $2 a ton in light black sheets at an early date. Several manufacturers have withdrawn from the market pending such a step, declining to obligate themselves any further on the basis of present prices. In heavy rails, 30,000 tons were added to the books of the local producer in the week under review. This interest is now practically sold up for the year and contemplates withdrawing from the market, having contracted for the delivery of over 600,000 tons in 1905. In this total is included the tonnage carried over from 1904. Structural steel has been active in the past week, contracts for buildings requiring 3,000 tons having been let. Bids were also asked on a project calling for 8,000 to 10,000 tons. The demand for plates shows no diminution, mills being from 60 to 90 days behind in deliveries. Cast iron pipe has been advanced 50 cents a ton, following the letting of several large municipal contracts. Bar iron shows a better tone, and prices appear firm at 1.65c. Scrap is also stronger and several lines of old material have been put up 50 cents a ton since our last report. Wire is active. The entire output of Western mills going into immediate consumption. Specifications for all other products are coming in freely, mills being pressed on every side for quick deliveries.

Pig Iron.—Activity in pig iron is more pronounced than at any period since last November. Important consuming interests are contracting largely; and taking their cue from these the smaller foundries have also commenced to patronize the market. The buying is very general and from a constantly widening area. Sales of lots from 1,000 to 3,000 tons have been numerous in the past week, the aggregate placed since our last report greatly exceeding that of the first week in March. Confidence in the stability of prices appears more general. In the case of Northern producers, there is a willingness to sell for deliveries right through the year on the basis of present prices, but Southern interests are restricting purchases to the third quarter. Prices are without appreciable change, though the market is stronger, Northern No. 2 foundry is being offered at $17.50 Chicago, and Southern at $13.50 Birmingham. The demand for charcoal, malleable and Northern foundry irons has been especially brisk in the past week, and the inquiry pending is of equally large proportions. We quote Chicago delivery, as follows:

Lake Superior Charcoal	$18 50 to 19 00
Northern Foundry No. 1	18 00
Northern Foundry No. 2	17 50
Northern Foundry No. 3	17 00
Northern Scotch Foundry	18 50
Ohio Strong Softeners No. 1	19 30 to 19 80
Ohio Strong Softeners No. 2	18 30 to 18 80
Southern Foundry No. 1	17 65 to 18 15
Southern Foundry No. 2	17 15 to 17 65
Southern Foundry No. 3	16 65 to 17 15
Southern Foundry No. 4	16 40 to 16 90
Southern No. 1 Soft	17 65 to 18 15
Southern No. 2 Soft	17 15 to 17 90
Southern Gray Forge	16 40
Southern Mottled	16 40
Southern Silveries (4% to 6% Silicon)	18 65 to 19 15
Jackson Co. Silveries (6% to 8% Silicon)	21 30 to 22 30
Jackson Co. Silveries (8% to 10% Silicon)	22 30 to 23 30
Alabama and Georgia Car Wheel	21 15
Malleable Bessemer	17 50
Basic Iron	17 65 to 18 15

Billets.—Intermediate rolled products are difficult to obtain in this market, there being only two interests that have any billets to sell. The Illinois Steel Co., a large producer of this product, is out of the market entirely, having been forced to buy 1,000 tons from another local maker in the week under

review. Except for occasional sales like the aforementioned, trading in open-hearth steel locally is limited to small lots of forging billets which are offered at premiums varying according to the needs and standing of the buyers. Wire rods have been advanced $2 a ton, and are now quoted $35 Pittsburg. Several sales have been made at this price, deliveries being restricted to the next 90 days. We quote forging billets, 4 x 4 and larger, up to but not including 10 x 10, up to .25 carbon, $28; up to and including .60 carbon, $1 extra. Rerolling billets, Bessemer or open-hearth, 4 x 4 and larger, $27 and upwards; billets, 3⅞-in. and small and sheet and tin bars, $28 and upwards; according to the tonnage and delivery.

Bars.—There is a better demand for bar iron than formerly, and the market has signs of increasing strength. Railroads, carbuilders and implement makers are the principal buyers. Reports are current that as low as 1.55c Chicago has been quoted, though this price seems now to have been entirely withdrawn. Specifications for steel bars are voluminous. Hoops are also in good demand. We quote carload lots, mill shipments, Chicago delivery, as follows: Bar iron, 1.60c to 1.65c; Bessemer and open-hearth bars and bands, 1.66½c base, half extras; soft steel angles, less than 3 x 3, 1.76½c; hard steel angles rolled from old rails, 1.60c to 1.65c; hoops, 1.71½c base, full extras. Store quotations are firm, and we quote on lots from warehouse stocks as follows: Bar iron, 1.90c to 2c base, full extras; soft steel bars and bands, 1.85c to 1.95c base, full extras; soft steel angles, channels and tees, 1.95c to 2.05c; hoops, 2c to 2.10c base, full extras.

Sheets.—The demand for all gauges and kinds of sheets is excellent, light black sheets in particular showing marked improvement. Several independent manufacturers of the latter have withdrawn from the market until higher prices rule, being unable to meet the competition of the leading producer in the face of the continued scarcity of sheet bars and the high prices asked for same. The announcement of an advance in this product is looked for daily. We continue to quote carload lots, Chicago delivery, mill shipments, as follows: Blue annealed sheets, Nos. 9 to 10, 1.81½c to 1.86½c; Nos. 11 and 12, 1.86½c to 1.91½c; Nos. 13 and 14, 1.91c to 1.96½c; Nos. 15 and 16, 2.01½c to 2.06½c. On box annealed, one pass, cold rolled, we quote Nos. 18 and 20, 2.21½c to 2.26½c; Nos. 22 and 24, 2.26½c to 2.31½c; Nos. 25 and 26, 2.31½c to 2.36½c; No. 7, 2.36½c to 2.41½c; No. 28, 2.46½c to 2.51½c; No. 29, 2.56½c to 2.61½c; No. 30, 2.66½c to 2.71½c. We quote on lots from warehouse stocks as follows: No. 10, 2.05c to 2.10c; No. 12, 2.10c to 2.15c; No. 14, 2.15c to 2.20c; No. 16, 2.25c to 2.30c; Nos. 18 and 20, 2.40c to 2.45c; Nos. 22 and 24, 2.45c to 2.50c; No. 26, 2.60c to 2.65c; No. 27, 2.70c to 2.75c; No. 28, 2.80c to .85c; No. 29, 2.90c to 2.95c. Galvanized sheets, mill shipments, Chicago delivery, are quoted as follows: Nos. 12-14, 2.56½c; No. 16, 2.71½c; Nos. 18-21, 2.86½c; Nos. 22-24, 3.01½c; No. 26, 3.21½c; No. 27, 3.41½c; No. 28, 3.61½c; No. 29, 3.86½c. Jobbers' prices on lots from store have also been revised, and are now as follows: Nos. 10 to 14 inclusive, 3.10c; No. 16, 3c; Nos. 18-20, 3.10c; Nos. 22-24, 3.25c; No. 26, 3.50c; No. 27, 3.70c; No. 28, 3.95c; No. 29, 4.40c; No. 30, 4.85c.

Structural Steel.—Contracts for the erection of the Commercial building and the addition to the Edison building were let last week and call for a tonnage of structural shapes aggregating 2,500 tons. Bids have also been asked on the steel required for the extension of the Boston Store, of this city, which according to present estimates will require from 8,000 to 10,000 tons. Several other building projects which have been pending for some time are being further considered, and the indications are that bids on these will be out in a few weeks. Increasing difficulty is noticed in getting shipments of structural shapes from Eastern mills, who are from two to three months behind in deliveries. Prices are without change and we quote carload lots, mill shipments, Chicago delivery, as follows: Beams and channels, 3 to 15 in. inclusive, 1.76½c; angles, 3 to 6 in., ¼ in. and heavier, 1.76½c; angles larger than 6 in. on one or both legs, 1.86½c; beams larger than 15 in., 1.86½c; zees, 3 in. and over, 1.76½c; tees, 3 in. and over, 1.86½c; with the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. We quote the new prices from store as follows: 2c to 2.10c for angles, beams and channels, base sizes, with 2.10c to 2.20c for 18, 20 and 24-in. beams; tees and zees, 2.05c to 2.15c. These prices are for either random lengths or cut to specifications in excess of 5 ft.

Plates.—No cessation is apparent in the demand for plates, Western producers in particular being literally "snowed under" with specifications. Deliveries cannot be given from mills within eight to twelve weeks. Jobbers are profiting by this condition, a large tonnage being deflected to these each week. Prices are firm, and we quote carload lots, mill shipments, Chicago delivery, as follows: Tank steel, ¼ in. and heavier, 6¼ in. to 14 in. wide, rectangular plates only, 1.66½c; over 14 in. to 100 in., 1.76½c base; flange steel, 1.86½c base; marine steel, 1.96½c base, all full extras. Plates, 3-16 in. thick, $2 extra; gauges, 7 to 8, $3 extra; No. 9, $5 extra. Less than carload lots, $5 extra. Store prices have also been advanced. Revised quotations are as follows: Tank steel, ¼ in. and heavier, up to and including 72 in. wide, 2c; over 72 in. wide up to 100 in., 2.10c; over 100 in. wide, usual mill extras; 3-16 in. up to but not including 72 in. wide, 2.10c; 3-16 in., 72 in. wide, 2.35c; flange steel, 25c extra; heads, 25c extra.

Rails and Track Supplies.—Orders for standard section rails aggregating 30,000 tons were taken by the Western interest in the past week. This mill has practically sold its capacity for 1905, and contemplates withdrawing from the market at an early date. In light rails, it is also comfortably filled, the demand for this product continuing of satisfactory proportions. Track supplies are very firm. We quote heavy sections in 500-tons lots and over, f. o. b. mill, $28; less than 500 tons to carload lots, $30; less than carload lots, $32. Light rails are as follows: 12-lb. sections, $27; 16-lb., $26; 20 and 25-lb., $25; 30, 35, 40 and 45-lb. sections, $24, all f. o. b. Milwaukee mill. Track supplies, f. o. b. Joliet mill: Angle bars, 1.40c to 1.50c; spikes, first quality, 1.70c to 1.75c; track bolts, 3¼ x ¾, with square nuts, 2.40c to 2.50c per lb., with hexagon nuts, 2.55c to 2.65c.

Merchant Steel.—There is little that is new to report regarding this product. The leading producers are sold up for the year, and continue to receive all the specifications they can fill. Prices are without change, and on carload lots, Chicago, delivery, mill shipments, are as follows: Spring steel, 2.10c; sleigh shoe, flat sizes, 1.71½c; concave and convex, 1.86½c; cutter shoe, 2.35c; smooth finished machinery steel, 1.91½c; smooth finished tire, 1.86½c; plow steel, 2.20c and upwards, according to quality; toe calk steel, 2.21½c. Cold rolled shafting, 50 percent off in carload lots and 45 percent in less than carload lots. Crucible tool steel, 6½c to 8c; special grades of tool steel, 13c and upwards.

Merchant Pipe.—The volume of business in pipe continues of good proportions. Jobbers and consumers are specifying freely against their contracts, taking all the tonnage that mills can supply. We quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ to ¼ inches	65.85	49.85	63.85	47.85
⅜ to ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85
EXTRA STRONG PIPE.				
⅛ to ⅜ inches	58.85	46.85	56.85	44.85
½ to 4 inches	65.85	53.85	63.85	51.85
4½ to 8 inches	61.85	49.85	59.85	47.85
DOUBLE EXTRA STRONG PIPE.				
½ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—No change is to be noted in the marketing of this product. The demand keeps up, being of an insistent nature from some classes of consumers. We quote carload lots, mill shipments, Chicago delivery, as follows:

BOILER TUBES.

	Steel.	Iron.	Seamless.
1 to 1½ inches	42.35	39.35	53.00
1¾ to 2¼ inches	54.35	39.35	40.00
2½ inches	56.35	44.35	43.00
2¾ to 5 inches	62.35	51.35	Up to 4½ inches 50.50
6 to 13 inches	54.35	39.35	.....

Less than carload lots from store, as follows:

	Steel.	Iron	Seamless Steel
1 to 1½ inches, inclusive	40	35	42½
1¾ to 2¼ inches, inclusive	50	35	35
2½ inches, inclusive	52½	35	37½
2¾ to 5 inches, inclusive	60	47½	47½
6 inches and larger	50	35	

Cast Iron Pipe.—Contracts have been closed by the leading producer in the last ten days for 1800 tons of pipe for Santa Anna, Cal.; 500 tons for Toledo, O., and 1,000 tons for Minneapolis, as well as several smaller lots. Youngstown, O., has rejected all bids on the 900 tons of pipe on which it recently asked prices, and will re-advertise same. Prices of cast iron pipe have been advanced 50 cents a ton in the past week. We now quote carload lots, Chicago delivery, as follows: 4-in., $29; 6-in. and larger, $28; gas pipe $1 a ton higher.

Wire Products.—There prevails the same insistent demand for wire materials as has characterized the local market for some time. The agricultural trade is especially heavy, and on smooth wire, fencing and barbed wire, mills are woefully behind in deliveries. Prices are firm, and we quote carload lots to jobbers, Chicago delivery, as follows: Wire nails, $1.95; painted barb wire, $2.10; galvanized barb wire, $2.40; smooth annealed wire, $1.80; smooth galvanized wire, $2.10; polished staples, $2.05; galvanized staples, $2.35. Less than carload lots to jobbers are 5 cents higher than above prices. The retail trade is quoted 5 cents extra over the foregoing on carload lots, and 10 cents extra on less than carload lots. Bale ties are unchanged at 82½ and 5 percent and 85 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet and DeKalb, with actual freight allowed not exceeding 30 cents per 100 lb.

Foundry Coke.—Coke is very strong in this market. Spot material is scarce and contract fuel is slow in coming forward. Prices range from $3.25 to $3.40 at the ovens for good Connellsville 72-hour foundry coke, or $5.90 to $6.05 Chicago. Some lots of Connellsville have been sold lower than these prices, but they have usually been of a low grade. Less popular brands of Virginia and West Virginia cokes are selling at from $2.50 to $2.75 at the ovens. Wise County, Virginia cokes are selling from $3 to $3.25 at the ovens, making the Chicago price $5.25 to $5.50.

Old Material.—There is a better tone to the local market, and though but a small volume of buying is in evidence prices are stronger. The greater portion of the demand is for small lots for filling in purposes. None of the big consumers is in the market, but when lots are offered at attractive prices which occasionally happens, they are taken up. Trading can be done at a price, but this has to be lower than the values quoted by dealers. We quote on gross tons, as follows:

Old steel rails (4 feet and over)	$15 00 to 15 50
Old steel rails (less than 4 feet)	16 00 to 16 50
Old iron rails	19 50 to 20 00
Relaying rails, subject to inspection	22 00 to 22 50
Relaying rails, without inspection	20 00 to 20 50
Old wheels	16 50 to 17 00
Heavy melting steel	14 50 to 15 00
Mixed country steel	9 50 to 10 50
Low phosphorus scrap (.05 and under)	14 00 to 14 50

The following quotations are for net tons:

No. 1 R. R. wrought	16 50 to 17 00
No. 2 R. R. wrought	15 50 to 16 00
Shafting	17 50 to 18 00
Dealers' forge, No. 1	12 00 to 12 50
Wrought pipe and flues	11 50 to 12 00
No. 1 cast, 150 lb. and less	13 50 to 14 00
No. 1 mill	11 00 to 11 50
No. 1 Busheling	11 50 to 12 00
No. 2 Busheling	10 50 to 11 00
Country sheet	8 00 to 8 50
No. 1 boilers, cut	11 50 to 12 00
Boiler punchings	13 50 to 14 00
Iron car axles	21 00 to 21 50
Steel car axles	16 50 to 17 00
Iron axle turnings	11 50 to 12 00
Steel axle turnings	11 00 to 11 50
Cast borings	8 25 to 8 75
Mixed borings, etc	8 25 to 8 75
Machine shop turnings	11 00 to 11 50
Railroad malleable	13 00 to 13 50
Agricultural malleable	12 00 to 13 00
Stove plate and light cast scrap	11 00 to 11 50
Old iron splice bars	18 00 to 18 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
BROWNING BUILDING, March 15.

Iron Ore.—Record breaking chartering for the season has been the feature of the past ten days and it is estimated that the carrying of 15,000,000 tons of ore has been contracted for on a basis of 75 cents from the head of the lakes. Of this immense amount, about 6,000,000 tons is credited to the United States Steel Corporation, which, it is estimated, will carry 10,000,000 tons in its own vessels. With 15,000,000 tons covered by season contracts, 10,000,000 tons to be carried by the corporation's fleet and several million tons by other producing-consuming interests, it is certain that the wild tonnage will not be large unless the total shipments exceed the estimate of 30,000,000 tons. It is probable that the shipping season will open about April 15. The only doubt at present entertained as to the ability to handle 30,000,000 tons is based on uncertainty concerning the railroads. It is, of course, possible that if present prosperous conditions change for the worse, shipments will be deferred and the total may then fall far short of the present large estimate. Cold weather has been unfavorable for shipping from docks to furnaces, but it is expected that within a week or two the rapid reduction of stocks on docks will be in progress.

Pig Iron.—Now and then a furnace interest will name a low price and take on orders in considerable amounts for a limited time, but in spite of such occurrences the market is strong. For No. 2 foundry $16 Valley is the usual selling price, but some companies which are not anxious to sell have advanced their quotations to $16.50. One interest which has sold up to Sept. 1 has made a sharp advance on its quotations at its lake furnaces. Basic is firmer and has advanced to $15.50 to $15.60 Valley. Bessemer is held at $16 Valley, for ordinary tonnages. For Southern, the usual price is $13.50 Birmingham for No. 2. There is more inquiry for all grades of foundry iron for the third and last quarters, but sales are not large. We quote as follows, Cleveland delivery:

Bessemer	$16 35 to 16 50
No. 1 Foundry	16 75 to 17 00
No. 2 Foundry	16 25 to 16 50
No. 3 Foundry	15 50 to 15 75
No. 2 Southern	17 35
Gray Forge	15 75 to 16 00
Gray Forge, Southern	15 85 to 16 00
Lake Superior charcoal	18 00 to 18 50

Finished Material.—Bar iron is the only product on which mills will promise quick shipment and on it prices are irregular, the usual quotation being 1.60c at the mill. On all other lines of finished material mills are crowded with orders and new business, except on steel bars, on which the price was recently advanced to 1.59½c Cleveland, or 1.50c Pittsburg, is coming in to add to the difficulties of delivery. Even standard rails, which have not been in strong demand, figure in recent orders. The demand for sheets is satisfactory and some mills are a month behind on deliveries. The prices of the principal producers through jobbers are as follows: Cleveland delivery, the freight from Pittsburg being 9½ cents: Mill sales of black sheets in carload lots No. 10, 1.84½c; Nos. 11-12, 1.89½c; No. 14, 1.94½c; No. 16, 2.04½c; No. 27, 2.39¼c; No. 28, 2.40¼c. Galvanized, mill sales, No. 14, 2.64½c; No. 16, 2.74½c; Nos. 18-20, 2.89½c; No. 22-24, 3.04½c; Nos. 25-26, 3.24½c; No. 27, 3.44 1-3c; No. 28, 3.64½c. Out of stock, black sheets, ¼ in.,

1.85c; 3-16 in., 1.95c. Blue annealed, No. 10, 2.05c; No. 12, 2.10c; No. 14, 2.15c; No. 16, 2.25c. One pass cold rolled: Nos. 18-20, 2.45c; Nos. 22-24, 2.50c; No. 26, 2.55c; No. 27, 2.60c; No. 28, 2.75c; No. 30, 3.10c. Galvanized out of stock, No. 16, 2.95c; Nos. 18-20, 3.05c; Nos. 22-24, 3.50c; No. 26, 3.40c; No. 27, 3.60c; No. 28, 3.80c; No. 30, 4.60c.

Old Material.—Mills are still reluctant about buying, but it is believed that the time when they will come into the market is not far distant. Business shows some improvement over the extreme dullness of last week. We quote as follows, gross tons, Cleveland:

Old iron rails	$23 00 to 23 50
Old steel rails (over 6 feet)	16 00 to 16 50
Old steel rails (under 6 feet)	16 50 to 17 00
Old car wheels	16 50 to 17 00
Steel boiler plate	13 00 to 13 50
Steel axles	17 50 to 18 00
Malleable iron (railroad)	16 00 to 16 50
Malleable iron (agricultural)	14 00 to 14 50
Heavy steel	16 00 to 16 50

We quote as follows, net tons:

No. 1 R. R. wrought	16 50 to 17 00
No. 1 busheling	14 00 to 14 50
No. 1 machine cast	14 50 to 15 00
Iron axles	20 00 to 20 50
Axle turnings	12 00 to 12 50
Wrought turnings (free from cast)	11 50 to 12 00
Grate bars	10 00 to 10 50
Pipes and flues	13 00 to 14 00
Tank iron	10 50 to 11 00
Hoop and band iron	9 00 to 10 00
Sheet iron	7 00 to 8 00
Wrought drillings	11 50 to 12 00
Stove plate	10 50 to 11 00
Cast borings	8 00 to 8 50

CINCINNATI.

March 14.

Coke.—The market is quiet with no change in quotations. Foundry coke is quoted at $3 and is easy at this price. Furnace coke is quoted at $2.50 to $2.75 f. o. b. ovens. There is practically nothing doing in the way of contracts.

Pig Iron.—As the first quarter of the year draws to a close the demand for foundry iron in this territory shows a slight increase, but it is apparent that iron purchased nominally for first quarter requirements was purchased in sufficient quantity by the smaller melters to carry them well into the second quarter of the year unless demand materially improves for their product. Orders during the past week have been scattering and mostly for small tonnages from a car load up to 200 tons. No large transactions of any kind have been reported and there are no important inquiries under consideration. Prices have not strengthened but are rigidly maintained, Southern iron being $13.50, Birmingham, for No. 2 foundry, which figure represents the market, although a few furnaces in the South are asking $13.75 to $14. The latter quotations, however, take very little business. In Northern irons there is less tendency to make reductions to induce business, and the general quotation at Ohio furnaces is $16 for No. 2, though $15.75 has been done in a number of instances. Trade sentiment is quite hopeful in its view of the situation, even though the buying and inquiry just at the moment are on a moderate scale and the attitude of buyers does not seem to warrant expectation of any appreciation in value. Sales agencies have made rather vigorous efforts to induce purchases during the past two weeks, but have failed to stimulate a buying movement of any importance, although they have done a fairly satisfactory business. We quote f. o. b. Cincinnati as follows:

Southern Foundry No. 1	$16 75 to 17 00
Southern Foundry No. 2	16 25 to 16 50
Southern Foundry No. 3	15 75 to 16 00
Southern Foundry No. 4	15 25 to 15 50
Southern Foundry No. 1, soft	16 75 to 17 00
Southern Foundry No. 2, soft	16 25 to 16 50
Gray Forge	15 00 to 15 25
Norhtern Foundry No. 1	17 40 to 17 65
Northern Foundry No. 2	16 90 to 17 15
Northern Foundry No. 3	16 40 to 16 65
Southern Charcoal	19 50 to 19 75

Finished Material.—There is a good demand for the entire list and the market is firm for everything in the steel lines. Prices for bar iron have been slightly reduced to put them more in conformity with steel bars. There is an improved demand for tank plates. Calls for structural shapes from stock are heavy and jobbers are rushed with orders on this class of demand. Bar iron is quoted at 1.60c to 1.65c; steel bars at 1.63c, half extras, with dealers quoting 1.85c for iron and steel out of store. Galvanized sheets at 75 and 7½ per cent off. We quote black sheets, No. 27, at 2.40c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.20c; No. 14, 2.10c; No. 12, 2.05c; No. 10, 2c. Tank plates are firm and sell out of stores at 2c for ¼-in. and 2.10c for 3-16 No. 8 and No. 10. Beams and channels are quoted at 2c from stock, and angles at 2c to 2.05c for base sizes.

In merchant pipe the market is quite satisfactory and trade is good in a jobbing way and the schedule of the leading interest fairly represents current values. Independent mills are so well supplied with orders that there is but little inducement to shade prices. We quote f. o. b. Cincinnati:

MERCHANT PIPE.

(Basing Discounts.)

	Steel Pipe.		Guaranteed. Wrought Iron Pipe.	
	Black. Percent.	Galv. Percent.	Black. Percent.	Galv. Percent.
⅛ and ¼ inches	65.85	49.85	63.85	47.85
⅜ and ½ inches	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	77.35	62.35
7 to 12 inches	68.85	53.85	67.35	51.85

Old Material.—The market is dull and largely nominal with not much inquiry or demand. Prices are not quotably changed but the tone of the market is easy. We repeat quotations:

Old No. 1 railroad wrought, net tons	$16 50 to 17 00
Cast machine and foundry, net tons	13 50 to 14 00
Old iron rails, gross tons	20 00 to 21 00
Old steel rails, gross tons	15 00 to 15 50
Old short lengths, gross tons	14 00 to 14 50
Old iron axles, net tons	19 00 to 20 00
Stove plate, net tons	9 50 to 10 00
Wrought turnings, net tons	12 50 to 13 00
Cast borings, net tons	9 00 to 9 50

NEW YORK.

OFFICE OF *The Iron Trade Review,*
ROOM 1315, NO. 150 NASSAU ST., March 14.

Pig Iron.—From the standpoint of sales, the local pig iron market during the past week was all that could be desired. A conservative estimate of the aggregate would be 50,000 tons. While all grades have been represented, the notable feature has been the heavy buying of foundry iron. Business coming to the foundries seems to be expanding weekly. While several round lots have been sold, it is the continued run of small lots that makes up the greater part of the tonnage placed. The majority of sales made during thet week have been for nearby delivery, with a goodly array of orders extending into the third quarter. The active selling of the week has brought about considerable irregularity in prices, and the sales reported show variations of from 25 to 75 cents per ton, but in the main quotations now ruling are no more than 25 cents per ton higher than last week. These remarks apply entirely to Northern irons, some sales of No. 2 foundry being noted at $16.50 at Eastern Pennsylvania furnaces, while others are reported at as high as $17. The market, however, is nearer the inside than outside figure. Southern irons have not shared much in the activity, and there has been no change in prices. It is still possible to place contracts for round lots of No. 2 foundry at $13.50 at the furnace, but it is said that small lots command $13.75. As for the market in general it can be said what prices show a tendency to harden, and the opinion is that those now ruling will be the minimum for some time to come. New York quotations at tidewater follow: Northern No. 1 foundry, $17.75 to $18.25; No. 2 foundry,

$17.25 to $17.75; No. 2 plain, $16.75 to $17.25; Southern No. 1 foundry, $17.75 to $18.00; No. 2 foundry, $17.25 to $17.50; No. 3 foundry, $16.75 to $17.00; No. 4 foundry, $16.25 to $16.50. Pig iron warrants are as follows March, $16.60 to $17.00; April, $16.70 to $16.90; May, $16.70 to $16.90; June, $16.70 to $17.00; July, $19.00.

Finished Iron and Steel.—So far as small orders are concerned, the week in structural shapes witnessed the placing of an excellent tonnage, but in orders of magnitude there has been a disposition to defer closing. The American Bridge Co. booked orders for about 7,000 of the 23,000 tons for prospective manufacturing enterprises noted last week, all of it in small lots. The Fort Pitt Bridge Co. received an order for 1,500 tons from the D. L. & W. for a new ferry house at Hoboken, N. J. The order of the New York Central road for 7,500 tons is still unplaced. A new bank here will call for about 700 tons. In plates, bars, and sheets, conditions are the same as they have been for several weeks past. New York prices at tidewater follow: Angles, 3 to 6 in. x ¼in. and heavier, 1.74½c; beams, 3 to 15 in., 1.74½c; channels, 3 to 15 in., 1.74½c; beams, 18, 20 and 24 in., 1.84½c; tees, 3 x ¼ in. and heavier, 1.79½c; plates, carloads, tank, 1.74½c; flange, 1.84½c; marine and ordinary firebox, 1.94½c; refined iron bars, 1.64½c; soft steel bars, 1.64½c to 1.67c; sheets, in carload lots, New York, No. 28, black, 2.50c to 2.55c; galvanized, 3.60c to 3.70c.

Old Material.—Sales increased during the past week, especially in heavy steel scrap, which is in excellent demand. Prices are very firm, and give every indication of going higher, the belief being that mills are very short of stock.

Old iron rails	$20 00 to 22 00
Old steel rails, long lengths	16 00 to 17 00
Old steel rails, short pieces	15 50 to 16 50
Relaying rails	21 00 to 22 00
Old car wheels	17 50 to 18 25
Old iron car axles	21 75 to 22 75
Old steel car axles	19 00 to 19 75
Heavy melting steel scrap	16 00 to 17 00
No. 1 railroad wrought scrap	20 00 to 20 50
Iron track scrap	17 00 to 18 50
Wrought pipe	15 00 to 15 50
Ordinary light iron	12 00 to 13 00
Cast borings	10 00 to 10 50
Wrought turnings	13 50 to 14 00
No. 1 machinery cast	16 00 to 16 50
Stove plate	13 50 to 14 00

PHILADELPHIA.

March 14.

The week has been rather quiet in pig iron, which was natural after the heavy buying of the preceding two weeks. Steel mills having pretty well covered their requirements, interest is shifted to foundry grades. The general outlook in pig iron and finished lines is favorable.

Pig Iron.—Some foreign iron has been brought to this city, but the product will be exported, subject to rebate in duty. Furnace operations have been interfered with to some extent by slow delivery of coke and by its inferior quality. Medium quotations fairly represent the market. We quote as follows for Philadelphia and nearby deliveries: No. 1 X foundry, $18 to $18.25; No. 2 X foundry, $17.50 to $18; No. 2 plain, $17 to $17.25; standard gray forge, $16 to $16.50; ordinary gray forge, $15.50 to $15.75; basic, $16.75 to $17; low phosphorus, $20 to $20.50.

Finished Material.—The market is not as lively as it was a week ago, but specifications continue to come in freely, and the present dullness in sales is not considered alarming. Prices are firm as follows: Beams, channels and angles, according to specifications, 1.73½c to 1.85c; small angles, 1.65c to 1.68c; steel bars, 1.63½c to 1.68½c; refined bars, 1.67½c to 1.80c; plates, 1.73½c to 1.78½c.

Old Material.—Buyers will not pay prices asked and holders are firm. Hence little business is being done. We quote as follows: No. 1 steel scrap, $17.50 to $18; low phosphorus scrap, $20.50 to $21.50; old steel axles, $20 to $21; old iron axles, $24 to $25; old iron rails, $24 to $24.50; old car wheels, $16.50 to $17.50; choice R. R. No. 1 wrought, $22 to $23; machinery scrap, $15.50 to $16; wrought turnings, $15 to $15.50; cast borings, $11.25 to $11.50; stove plate, $13.50 to $14; wrought iron pipe, $16.50 to $17.

BIRMINGHAM.

BIRMINGHAM, Ala., March 13.—More than one furnace company in Alabama has practically withdrawn from the iron market as far as delivery during the second quarter of the year goes. In addition to being behind with deliveries on old business at least one company is unwilling to stock up further on orders. The Alabama Consolidated Coal & Iron Co. last week notified agents throughout the country to be careful about selling more iron for delivery in April, May and June. It is announced that during the past week quite an amount of iron was disposed of. The sales are being made in lots from 500 to 2,000 tons. Production shows no improvement in this State. The raw material supplies are holding up well, all things considered.

Some sales have been made in Alabama for delivery during the third quarter of the year. An inquiry is being received also for iron to be delivered during the last quarter of the year. Indications point to a steady demand for pig iron in the Southern territory during the balance of the year. The probable make will hardly be in excess to the demand. There is absolutely no accumulation in this district and the statement is made on good authority that the greater portion of the iron to be seen on the furnace yards in this district has been sold and only awaits instructions as to shipment.

The report of the Alabama Car Service Association for the month of February shows a decided falling off in the number of cars handled in this State. The iron production last month was decidedly short in this State.

The following quotations are given: No. 1 foundry, $14 to $14.25; No. 2 foundry, $13.50 to $13.75; No. 3 foundry, $13 to $13.25; No. 4 foundry, $12.75 to $13; gray forge, $12.25 to $12.50; No. 1 soft, $14 to $14.25; No. 2 soft, $13.50 to $13.75.

The Bessemer rolling mill, Tennessee Coal, Iron & Railroad Co., continues to work exclusively on steel. A new engine and roughing mill has been installed and the capacity of the plant has been increased.

The Sloss-Sheffield Steel & Iron Co. has authorized a semi-annual dividend of 2½ percent on common stock and the usual quarterly dividend of 1¾ percent on preferred stock. These will be paid in April and will call for more than $300,000. The annual meeting of the directors of the company will take place next week. There will be no changes in the official family, according to an authoritative statement.

The Metal Market.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., March 14.

Pig Tin.—Speculative interests were in control of the market during the past week, and succeeded in advancing prices appreciably, although trade conditions are the same as they have been for weeks. The London market for the week has been active and prices are over £1 higher than last week. Today's closings follow: Spot, 29.35c to 29.65c; March, 29.35c to 29.65c; April, 29.25c to 29.50c. London's closings follow: Spot, £134 15s; futures, £133 15s. Arrivals at Atlantic ports for the month to date aggregate 1,995 tons, with 3,220 tons afloat.

Copper.—The domestic situation presents the same featureless aspect as for weeks past. The buying has been on the hand-to-mouth basis, and prices are unchanged. In London the market has been fairly active, and prices have

advanced slightly. Today's closings follow: Lake, 15¼ to 15⅜c; electrolytic, 15⅛ to 15¼c; casting, 14⅞ to 15c. London's closings today follow: Spot, £68 13s 9d; futures, £69 1s 3d. Exports for the month to date amount to 8,665 tons.

Lead.—Is without interest and practically unchanged at 4.50 to 4.60c. St. Louis is higher at 4.37½ to 4.15c. London declined to £12 5s.

Spelter.—Is more active and higher at 6.15c to 6.30c. St. Louis is steady at 6.12½ to 6.15c. London is stronger at £24.

Antimony.—All brands unchanged, Cookson's and Hallett's being 7⅞c to 8⅛c, and other brands 7c to 7⅝c.

Quicksilver.—We quote $38 per flask of 75 lb. lots of 100 flasks. London is £7 12s 6d.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, March 14.

The metal market has sustained no changes either in prices or condition since our last report. Actual buying is of light proportions, though the interest in the market and inquiry for material seem to have improved. We quote prices, Chicago deliveries, as follows: Lake copper, in carloads, 15⅜c; less than carload lots, 15⅝c. Casting copper in carloads, 15⅛c; less than carload lots, 15⅜c. Spelter, 6¼c for carload lots, and 6½c to 6¾c for smaller lots. Sheet zinc is unchanged at 7¼c for carload lots of 600-lb. casks, and 7½c for less than carload lots. Pig lead, 4.45c for 50-ton lots; 4.50c for carload lots, and 5c for less than carload lots. Pig tin, 29¾c for carload lots, and 30c for less than carload lots. Cookson's and Hallett's antimony, 9c. Nickel is 45c to 60c, according to amount and deliveries.

Old metals are strong, and prices are firmer than they have been in several weeks. Dealers' quotations are approximately as follows: Copper wire, 13¼c; heavy copper, 12¾c. Light copper, 11¾c. Red brass, 11¾c; red brass borings, 10⅛c. Yellow brass, 8¾c; yellow brass borings, 7½c. Pipe lead, 4c. Tea lead, 3.60c. Zinc, 4¼c.

Monthly Blast Furnace Report.

J. G. Butler Jr., chairman of the Bessemer Pig Iron Association, states that of the 192 furnaces reporting to the association with a daily capacity of 57,579 tons, 169 were in blast March 1. The active capacity on that date was exactly 90 percent, an increase of 1 percent since Feb. 1. Few additional furnaces are in condition to be blown in.

A Large Bridge Contract.

The Riter-Conley Mfg. Co., Pittsburg, has been awarded the contract for reconstructing 125 bridges on the West Shore division of the New York Central Railroad. About 15,000 tons of structural steel will be required in doing the work. The contract for the steel has been awarded to the Carnegie Steel Co. Many of the bridges to be replaced were built only ten years ago, but owing to the increased weight of rolling stock and heavier traffic it is deemed advisable to replace the lighter structures with heavier ones. The bridges to be replaced between Rotterdam Junction and Buffalo and those on Marble Hill cutoff. The bridges will be constructed of plate girders, lattice girders, open web lattice girders and pin constructed spans. The length of the spans will range from 20 to 200 ft. and the longest bridge will be a little over 400 ft. long.

Curtis & Co. Mfg. Co., of St. Louis, manufacturer of saw mill machinery, air hoists, compressors and pneumatic appliances, expects to complete in the coming summer the new plant it has under erection. The building will be of steel and cement construction and the machine shop and foundry will be equipped with the most modern machinery.

NEW IRON AND STEEL CAPACITY.

While there have been no new ventures of importance in the iron and steel manufacturing field since the improvement in trade conditions set in six months ago, there is a large amount of new work and installations proposed and under way undertaken by existing concerns. Announcement has just been made that the Youngstown Iron Sheet & Tube Co., Youngstown, O., has decided to erect a Bessemer plant and plans are now being prepared. This company has been a buyer of Bessemer billets and slabs from the Republic Iron & Steel Co. to the amount of approximately 60,000 tons a year, while orders placed with other steel producers have been heavy. The company owns the Alice furnace at Sharpsville whose capacity will about half meet the requirements of the steel plant to be built.

The Carnegie Steel Co. has plans prepared for the erection of another stack at Mingo Junction, O., the output of the three furnaces at this plant not being sufficient to meet the requirements of the Bessemer steel plant. As previously announced the Republic Iron & Steel Co. will build another furnace at Youngstown, O., on the site of the old foundry of the Andrews plant, in view of the increase in the capacity of the company's Bessemer plant. In addition the company has under way a new rail and sheet bar mill which will be completed late in the summer. With this mill in operation it is doubtful if the Bessemer plant will have sufficient output to meet the new mill requirements and also to take care of the contract of the Youngstown Iron Sheet & Tube Co. and that of the Pittsburg Steel Co., the latter being 10,000 tons a month. While nothing has yet been decided, it is likely that the Ohio plant of the Carnegie Steel Co., Youngstown, will be enlarged by the erection of additional furnace capacity and additions to the steel works. At McKeesport, Pa., the National Tube Co. has a third blast furnace under way and the practical rebuilding of the pipe and tube mills at that place will cost close to $10,000,000. This work cannot be completed in less than two years. The new furnace of the Wheeling Steel & Iron Co., Martins Ferry, O., was recently completed but is awaiting an ore supply, and this stack will not be a producer of iron until the season of lake navigation opens.

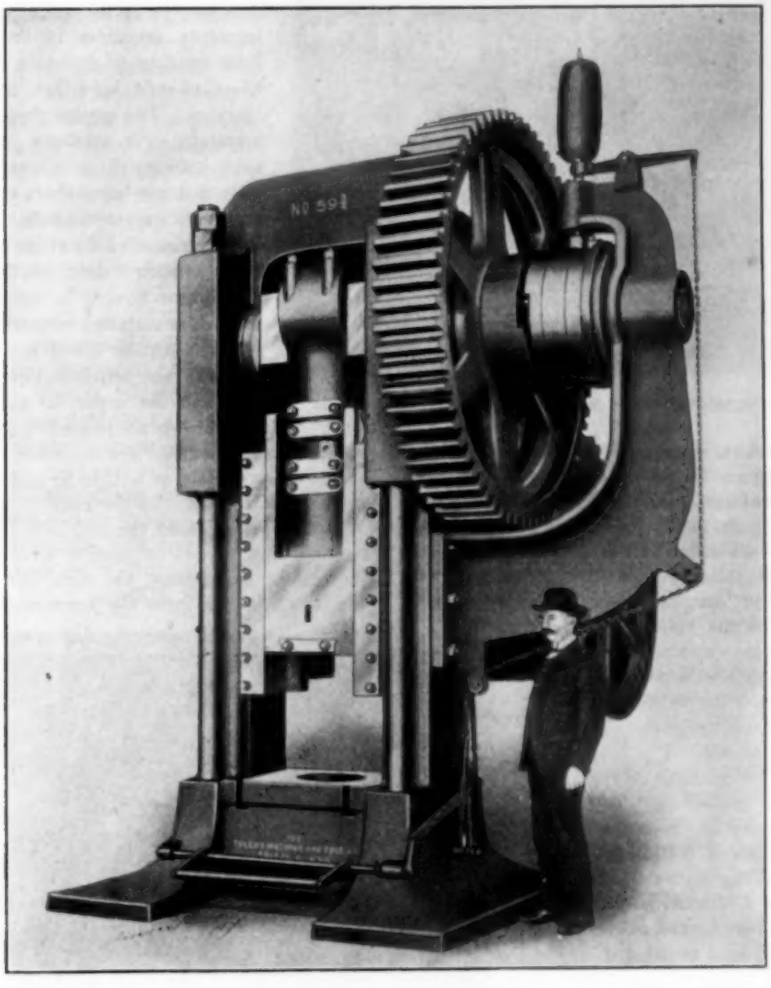
The Carnegie Steel Co. is installing a new sheet bar mill at its Columbus, O., works. As soon as the mill is completed the steel plant will resume operation. The two blast furnaces have been in operation for some time, the iron being sent to Cleveland. Repairs are also under way at the steel plant.

The greatest increase in steel-producing capacity is being made by the Jones & Laughlin Steel Co., Pittsburg, who have four Talbot open-hearth furnaces under way. When these are in operation the company's steel output will be greater by 1,000 tons daily. One of these furnaces is almost completed and will be fired before the end of the month, while a second will be started in May. The Allegheny Steel & Iron Co., Avenue, Pa., and the Sharon Steel Hoop Co., Sharon, Pa., have both increased their open-hearth capacity by the erection of an additional furnace of 35 tons capacity. The Allegheny Steel & Iron Co. also has a 72-in. plate mill under way, while the Sharon Steel Hoop Co. is installing a Morgan continuous hoop and band mill. The LaBelle Iron Works, Steubenville, O., are building an 84-in. plate mill which will be ready to operate about the middle of the year.

All of the Saxman coal interests in the Latrobe, Pa., district have consolidated under the name of the Latrobe-Connellsville Coal & Coke Co. The following companies are included in the consolidation: Saxman Coal & Coke Co., Superior Coal & Coke Co., Latrobe-Connellsville Coal & Coke Co., Ligonier Coal & Coke Co., and the Derry Coal & Coke Co. The new company will control about 3,000 acres of coal and 570 coke ovens.

SINGLE CRANK DRAWING PRESS.

This press, built by the Toledo Machine & Tool Co., of Toledo, O., is an unusually powerful single pitman straight-sided machine designed for deep stamping of metal up to ⅜ in. in thickness. The frame casting weighs 40,000 lb. and is reinforced by four 5-in. tie rods. The crank shaft is 13 in. at the bearings. The stroke is 14 in. and the length of the slide bearings 55 in. Shaft and connection screw are high carbon open-hearth steel forgings. The screw has right and left hand threads for slide adjustment and is held in position by caps, each having four bolts. The clutch is automatic, of the three engagement sliding block type and is controlled by a gravity release attachment. This is without the usual springs and the clutch is positive and reliable. The press is geared 1 to 15. The large gear has teeth cut from the solid with ¾ diametral pitch and 14-in. face. The press bed is 38 x 38 in. and the width between uprights 38 in. The machine complete weighs 95,000 lb.



A LARGE DRAWING PRESS.

The railroads west of Chicago have agreed to put into effect a new tariff reducing the rates on steel rails 50 cents per ton from Chicago to all Missouri river points. The new charges are as follows: From Chicago to Missouri river, $2; from Mississippi river to Missouri river, $1; from Peoria to Missouri river, $1. To meet as far as possible this competition the Colorado roads have put in a new tariff reducing the rates from Pueblo to the Missouri river to $2.75 a ton.

PENNSYLVANIA RAILROAD EXPENDITURES.

Although an outlay of $75,000,000 by the Pennsylvania Railroad Co. this year for construction and equipment had been discussed, the amount officially authorized to date is $30,000,000. It is understood that the larger part of this sum will be applied to the completion of the construction of the low grade freight line from Harrisburg to Glen Loch. Other main items in the list of expenditures upon the main line for 1905 will be the construction of the elevated freight road along Duquesne way and the new freight station at the Point, Pittsburg. Some of the remaining expenditures will include the extension of the four-track system on the Monongahela division, and the second track and sidings through the coke region. Besides this, large sums will be spent in the completion of the four-track systems on the Pittsburg and middle divisions. In all probability fully one-third of the appropriation will be spent for new motive power and rolling stock. It is probable that the car and locomotive orders for this year will be greater than for several years. Large sums, it is said, will be spent in making provision for a permanent water supply along the entire line from Philadelphia to Pittsburg. Serious delay resulted last year in handling the traffic on the Pittsburg division from insufficient water supply during the drought.

Involuntary bankruptcy proceedings have been filed against the Dayton Foundry Co., Dayton, O. Jacob D. Pflum was appointed receiver.

THE SHOPS OF THE ELECTRO DYNAMIC CO.

The several illustrations below present views of the new plant of the Electro Dynamic Co. at Bayonne, N. J. The works are situated on the water front at Bayonne and have railway connections, sidings leading directly into the plant, and all facilities for ready shipment of the product. The machine shops are new and equipped with modern tools for the manufacture of electric motors, more particularly those of the so-called variable speed type. The intention of the company is to specialize in the manufacture of electrical apparatus and concentrate its energies upon motors peculiarly adapted to direct driven machinery, and from past experience the firm believes the results of this policy will be most satisfactory.

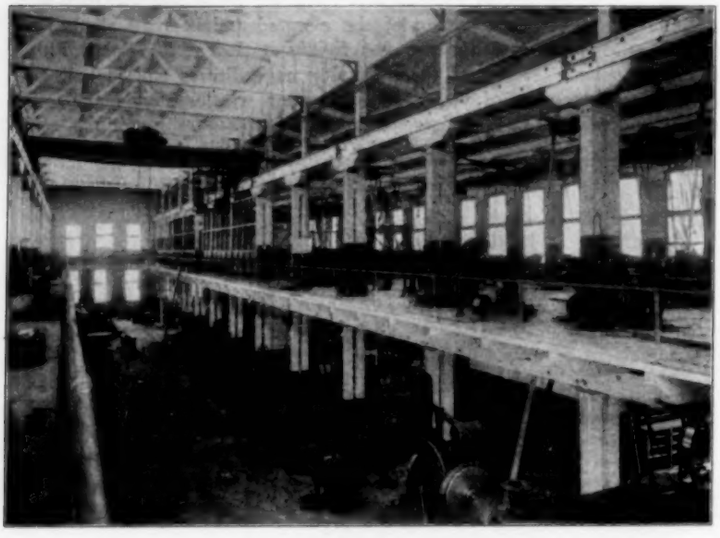


FIG. 1.—THE MAIN BAY IN MACHINE SHOP.

The plant, as the views indicate, is a typical example of the application of electricity to the machinery of the shops. In this respect it also exhibits the utility of the shop product, the manufacture of electric motors being carried on. Group drives and individual connections to motors are selected as the exigencies of the respective cases demand. The small machines in the tool room, for example, are grouped together in sections—each section operated by an individual motor. The larger machines on the 21-in. Bement, Miles Co.'s slotter in the foreground of Fig. 1, and the heavy drilling machines in Fig. 2, are appropriately driven by a separate motor in each case. The 21-in. slotter is connected to the motor by silent chain and the Bickford radial drill in Fig. 2 has a geared connection.

The peculiar type of motor which forms the product of the Electro Dynamic Co.'s shops is clearly shown—though the illustration is necessarily small—in Fig. 2. It is claimed that the motor can be set to run at any speed between 275 and 1,400 revolutions per minute and will maintain this set speed without perceptible variation, whether operating under no load or full load. The motor has excellent commutation when running in either direction and at any load from no load to 100 percent overload, is simple in control and has very high efficiency under all conditions of service. The conditions of sparkless commutation are described by the company with a preliminary reference to the characteristics of the ordinary constant speed motor.

This discussion is substantially as follows: When a brush is in contact with two adjoining commutator segments, the coil connected between the pair is short circuited on itself. The resistance of the short circuited coil, together with the connections to the commutator being very small, as compared with the contact resistance of the brush pressing on the commutator, the strength of the currents flowing toward the brush from the respective commutator segments will to a great extent be dependent upon the relative value of the contact resistance and the larger the latter the smaller will be the currents. This quality of the carbon brush tends to prevent sparking. As the short circuited coil passes under the brush the current flowing in it is reversed, passing from the maximum in one direction down to zero and then up to the minimum in the opposite direction. The current thus varying in the coil short circuited between the segments generates in the coil an electromotive force tending to maintain this varying effect. The effect of self induction, therefore, is to produce sparking. The current flowing through the various armature coils produces a magnetic field in the space between the pole corners, in the region of the coils that are being short circuited. These coils in their rotation cut the lines of force of this field and an electromotive force is generated in them, this being in such a direction that it tends to maintain the current flowing in the coil. The effect, therefore, of armature reaction is to produce sparking. In the constant speed motor the main causes of sparking are self-induction of the short circuited coil, and the action of this coil in generating a maintaining electromotive force by cutting the field of the armature. These are overcome in part by the resistance or the brush contact as well as by placing the brushes that the short circuited coil is in the edge of the main magnetic field. When properly placed the coil cuts lines of force in such a manner that the electromotive force generated aids in the reversal of the current, the main field being used to prevent the lines of force from the armature field passing out in the region of the short circuited coil. It is possible in the constant speed motor to control the sparking by the means described, but these are inadequate for the variable speed motor. The reduction of the field strength necessary to obtain high speeds prevents its use in overcoming the magnetic field of the armature. The armature field is not only present but the increased speed of the armature proportionately increases the

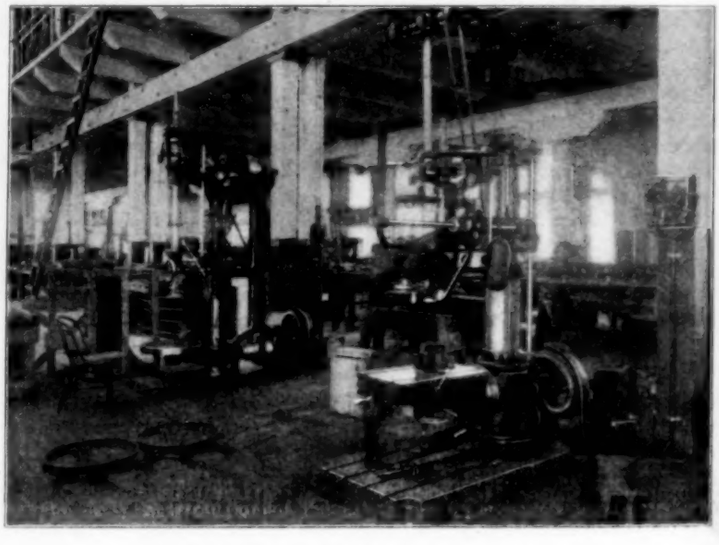


FIG. 2.—DRILLS WITH INDIVIDUAL MOTOR DRIVES.

maintaining electromotive force until the carbon brush cannot overcome it. The company controls the conditions making for destructive sparking by providing a magnetic field independent of the main field of the motor. This is done in the interpole motor by auxiliary poles. These are small compared with the main poles and are located between the latter and provided with coils connected in series with the armature. The armature current flows through the coils of the auxiliary field, which is proportioned for adequate commutation. All the coils of the auxiliary field being connected in series with the armature, weakening of the field of commutation by increased loads is avoided and the auxiliary poles produce a compensatory field to meet the deficiencies of the main field with increased armature speed. The effect of the auxiliary field is independent of the direction of rotation of the armature.

The interpole motor is unique in having ball bearings. These may have been applied to motors or generators previously as a matter of experiment, but as an element in regular motor manufacture this is claimed as a decidedly novel and valuable feature. The general smooth running and efficiency is found to be improved and the absence of the flying oil brings about a condition of cleanliness especially advantageous around electrical apparatus. These motors are made in enclosed, semi-enclosed and open types and can be set in any position. The brush holder rig is of simple construction and the armature shaft is unusually large in its proportion to the rest of the machine, though the motor as a whole is claimed to have less weight than any other. The interpole motor operates on a single voltage circuit.

The Empire Steel & Iron Co., Catasauqua, Pa., has elected the following officers and directors to serve for the ensuing year: President, Leonard Peckitt; vice president, Charles H. Zehnder; secretary and treasurer, J. S. Stillman. Directors: Leonard Peckitt, Mark T. Cox, Charles H. Zehnder, Frank M. Jeffery, Elverton R. Chapman, Junius S. Morgan, James W. Fuller, Arthur A. Fowler, Anderson Fowler.

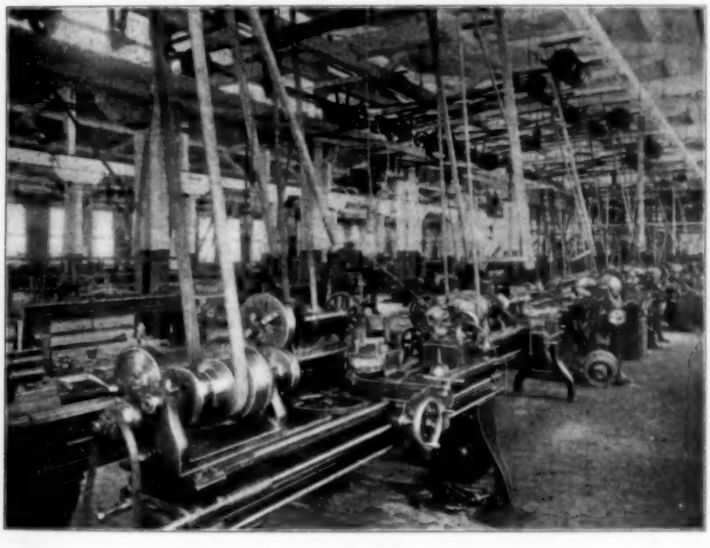


FIG. 4.—TOOL ROOM WITH GROUP DRIVE.

The Fowler Nail Co., of Seymour, Conn., has sent a calendar showing excellent illustrations of the famous trotter, Major Delmar. One of the pictures presents a view of the horse making the 2:01¼ mile at Memphis, Tenn., Oct. 24, 1904.

NEGOTIATING FOR THE TIDEWATER STEEL CO.

Charles M. Schwab has confirmed the report that he was interested in negotiations for the lease of the Tidewater Steel Co., Chester, Pa., but stated that it was a personal matter and one in which the Bethlehem Steel Corporation was in no way interested. Mr. Schwab added: "Of course the Tidewater Steel Co. if acquired will be utilized for the benefit of the Bethlehem Steel Corporation. For example, the ores we receive from Cuba can be converted by the blast furnace of the Tidewater company. The Bethlehem Steel Corporation is doing very well and the extensions are being pushed forward as rapidly as possible. We have disposed of the Bath Iron Works and the Hyde Windlass Co. to John S. Hyde, J. R. Andrews and other interests. The money received for the properties will be turned over to the treasury of the Bethlehem Steel Corporation."

FIG. 3.—ANOTHER VIEW IN MACHINE SHOP.

Mr. Schwab said that it was not the intention of the company to dispose of any more plants. He says there is absolutely no truth in the report that he has purchased land on the Jersey coast to be used as a site for building warships for Russia. While abroad Mr. Schwab will visit St. Petersburg for conference with Russian officials as to the making of armor plate for the czar's new navy. It is likely that a number of Russian ships will be built by the Bethlehem Steel Corporation.

Harold C. Hooke, of New York has brought suit in the Chancery Court to compel the Illinois Car & Equipment Co. to show cause why the reduction of the par value of the capital stock should not be declared void. The complainant holds twenty shares of stock purchased from C. Lawrence Perkins previous to the reduction in the stock from $25 to $10 a share. He alleges that less than two-thirds of the stockholders were present at the meeting when the reduction was made. At the time the directors reduced the capital stock from $2,000,000 to $800,000.

Preferred and common stockholders of the American Iron & Steel Mfg. Co., at a special meeting at Lebanon, Pa., voted unanimously to reduce the common stock from $17,000,000 to $2,550,000 and the number of such common shares from 340,000 to 51,000 of par value of $50.

WELDING BROKEN BOSSES ON ROLLS.

Hitherto it has been the practice to make the broken boss red hot by means of a basket of coke placed upon it, and then liquid iron or steel was poured on it. This is rendered unnecessary by the application of thermit, which does the work more simply, cheaply, and effectually. Thermit, ignited on a cold surface, deposits on it a layer of its corundum slag, which adheres firmly. To avoid this, a thin layer of cast iron or steel is poured on to the welding surface before thermit is placed on it, and to avoid the adhesion of corundum at the sides, a concentric iron ring is so fixed in the mold that it can be withdrawn after ignition of the thermit. See Fig. 1.

The method of procedure is as follows: The roll is firmly fixed in such a position that the welding surface lies horizontally. After placing the first mold, which has a diameter exceeding by 2½ in. that of the boss to be welded, a cast iron ring, with two lugs attached for lifting, is placed in the mold. This ring is ½ in. thick, and stands off about ½ in. from the inner wall of the mold as in Fig. 2. It is constructed so as to overlap like a flange the upper part of the lower mold box without touching its edge. The ring must be well covered with graphite, and the inner surface well smeared with clay and dried. It must tightly fit the roll, and, where necessary, spaces must be stopped with clay. The clay must not exude on the inner face, as moisture on the welding surface is bad. The flange-like rim of the ring overlaps the edge of

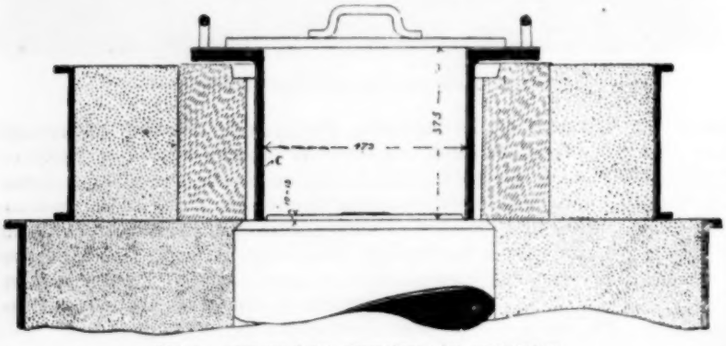


FIG. 1.—TOP OF ROLL PREPARED FOR REPAIRING.

the mold, and protects it from any iron which may splash up during the reaction and pouring of the metal.

About 30 lb. of thermit are required to the superficial foot of cast iron surface. This quantity will soften the metal to a depth of about 2 in. For steel rolls, 10 percent to 20 percent more thermit is required than for iron. It is not necessary to make the roll red hot, a basketful of coke placed inside the mold until the iron cannot be touched by the hand is sufficient. A few sandpits surrounding the roll, and filled with a few hundred pounds of cast iron, will do as well, even with very large rolls.

After firmly imbedding the ring in the mold box, a thin layer of cast iron or steel, say ½ in., is poured into it, and must completely cover the welding surface. A thin layer of powdered charcoal can be used instead, but has the objection of producing a spray of sparks. The whole of the thermit, accurately calculated and weighed, is then quickly added. Very hot liquid steel will ignite it at once, liquid cast iron will not do so and then thermit must be ignited in the usual way, viz., a thimbleful of ignition powder is placed upon it in a small heap and lighted with a hot iron or a fusee. Immediately after ignition, the mold should be covered with an iron or wood lid covered with clay on its under side, the wood will char but not burn. The reaction, even with large quantities of thermit up to 175 lb. at a time, is finished in half a minute, and the lid must at once be removed and the thermit stirred with iron rods, so as to disturb the slag (corundum). The heat of the reaction, even with only 20 to 30 kilo thermit, is so intense that the workmen must protect their hands and faces in the usual way for work at crucible furnaces, by using colored glasses, and covering their hands with cloth.

After a few minutes cast iron or steel is poured out of the ladle, which must be in readiness, into the mold to about a third of its capacity. When cast iron is poured on to thermit during reaction, it is especially necessary to stir the metal thoroughly, in order to obtain a thorough mixture of the thermit iron with the cast iron, and prevent any steel being formed on the welding surface, but if properly stirred steel never forms. A number of stirring rods must be held in readiness, as the heat melts them quickly, until the cast iron is added. Two or three men ought to be employed simultaneously to stir the metal for several minutes, after which the iron ring is lifted out. The whole of the corundum will then be found adhering to the inner surface of the ring and is lifted out with it, the ring is protected from melting by the adhering corundum and can be used several times. The ring prevents the slag from clinging to the mold itself. After withdrawing the ring, more iron, constantly stirred up, is added until the lower mold is filled. The remaining slag which will have coagulated in small pieces is carefully taken off before the second mold, Fig. 2, which may be of trefoil shape, is placed in position.

A great advantage is gained by this method of reducing the waste of metal resulting from the usual rift in the cast. The subsiding takes place very regularly in consequence of the addition of the thermit. The rifts have much less depth, particularly if kept open by pumping with feeding rods as long as possible.

The cast iron added in the process has a peculiarly firm structure entirely due to the thermit. What takes place during the welding process is as follows: On the bottom of the mold a number of particles of iron are collected and brought to a very high temperature through the action of the thermit, these have a tendency to rise to the surface while the upper parts sink to the bottom. This causes a very lively "play" of the iron, and the impurities (particularly of cast iron) are more readily separated and the cast appreciably improved. The addition of the thermit also renders the cast iron more fluid, which can be observed even with an addition of only ½ to 1 percent, but thorough stirring is absolutely necessary in order to obtain a good mixture of the specifically heavier thermit iron with the lighter cast iron.

If the break is cup-shaped, the hollow which is formed must first be filled with cast iron or steel, upon which the thermit is ignited. In order to heat up this greater quantity of metal an excess of thermit over what is stated above must be used. Such hollow breaks could not be repaired by the old method of running metal over them. If the break is very slanting, part of the roll is knocked off to obtain a fairly level surface, but there is no need to have it absolutely horizontal.

Cast iron or steel rolls can be repaired in this way and a cast iron boss can be welded on to a steel roll or a steel boss on to a cast iron one. Rolling mills being as a rule unable to obtain liquid cast iron easily, the latter application is of special interest to them. They need not send the broken roll away, but can repair it in their own shops with liquid steel, and avoid the stoppage of work often necessitated by a broken roll. W. Hugo, director of the Aktien-Gesellschaft Phoenix-Eschweiler-Ane, says: "The roller boss welded by your process broke at a point some 7 in. from the weld after rolling 198½ tons of material. From the appearance of the fracture we do not consider that the break is in any way due to the welding process that the roller has been subjected to."

It has been calculated at several plants having this method in use that the cost is barely half that of the old method, even

when the iron allowed to overflow can be utilized for smaller and less important casts. Some works have carefully tested the strength of such thermit welded rolls. Hammer tests have proved that any breaks occur outside the welds. Reports show that test bars cut out of the rolls always tore a long way from the weld. Of course, all solid pieces of metal can be repaired in exactly the same manner as described for rolls.

Welds to be effected on cast iron pieces of less solid construction are more difficult, as, in consequence of the strains that exist in every piece of cast iron, breaks occur near the welds. This is particularly the case in repairs of cast iron boilers, pipes, cylinders or pulleys. Even with such slight or divided pieces, however, a favorable result may be obtained by first annealing the whole piece. In the case of small welds on cast iron, care must be taken to add further quantities of the liquid cast iron, as a mixture of cast iron and thermit, or its resulting iron, in the proportion of 10 to 1, would produce a hard, unworkable steel it is necessary always to use 15 to 20 times more cast iron than thermit. The thorough mixing of the metals must be most carefully watched. The cast iron ought to run from a good height out of the ladle, and the stirring should be done thoroughly. In many cases a certain quantity of cast iron might be allowed to overflow the mold to avoid having to work off too big a waste of metal round the rift. Or a hole may be arranged in the mold at a proper distance from the bottom to allow the superfluous iron to run away.

The main feature of this application of thermit, for which no crucible is required, is the advantage gained by being able to bring any surface to welding heat, and that in an even and speedy manner.

Analyses of Lake Superior Ores.

The Lake Superior Iron Ore Association has issued from its secretary's office in the Western Reserve building, Cleveland, a pamphlet containing tables and complete cargo analyses of Lake Superior iron ores, the samples having been taken from shipments of 1904. In a few cases expected analyses for 1905 are given. Of the ores for which analyses are given 35 are from the Geogebic range, 45 from the Marquette range, 26 from the Menominee range, 44 from the Mesabi range, 6 from the Vermillion range and 1 each from the Michipicoten and Baraboo ranges. The analyses of Illinois ore from the Baraboo range is given as follows, for the ore dried at 212 degrees Fahr.: Iron, 54.27; phosphorus, .052; silica, 17.42; manganese, .21; alumina, 1.52; lime, .41; magnesia, .20; loss by ignition, 2.02.

Trade Publications.

Some comparative tests on Hyatt roller cast iron, bronze and babbitt bearings, by Arthur L. Williston have been printed in pamphlet form by the Hyatt Roller Bearing Co., of Harrison, N. J. The tests show the starting torque and friction of bearings under various conditions. They were made at the suggestion of the Cincinnati Rolling Road Co., and this firm has now the Hyatt roller bearing in use. The results of the investigation make interesting reading. Mr. Williston, who is chief of the mechanical department of the Pratt Institute of Technology, Brooklyn, N. Y., comments upon one of his deductions as follows: "It may be a surprise to some to see the co-efficient of friction for the bronze bearings considerable higher than the co-efficient of friction for cast iron, in view of the fact that bronze is used in preference to cast iron in engineering practice in so many places. It is, however, a well known fact that cast iron is an admirable bearing material so long as its surface can be maintained in perfect condition, and so long as there is perfect freedom from dirt and grit and also perfect lubrication. The most valuable property of bronze as a bearing metal is the fact that it does not readily become scored or cut by the pressure of dirt or poor lubrication as does cast iron."

The Johnson patent arch plate has already been described at some length in *The Iron Trade Review* and reappears in a neat illustrated circular from the makers, the Wellman-Seaver-Morgan Co., of Cleveland. The purpose of the device and its construction are explained with directions for ordering this useful adjunct in repairing and rebuilding furnace door arches.

The theory and practice of painting on metal is discussed by A. H. Sabin in a 65-page, 6 x 9-in. publication, received from Edward Smith & Co., of New York. Mr. Sabin is an expert chemist, having an especial acquaintance with paint possibilities in engineering practice. His practical comments upon paint and paint specifications are excellent advertising with this substantial foundation. A number of informing illustrations add worth to an entertainingly suggestive bid for business.

The Kempsmith miller is admirably exploited in a recent catalogue of the Kempsmith Mfg. Co., of Milwaukee. The pamphlet is of generous dimensions, about 8½ x 12-in., and starts out with a brief mention of the enlarged field of the miller in modern machine shop work, its progress from the exclusively tool room location to that of a manufacturing machine. The Kempsmith Mfg. Co. has been building millers as its one product since 1888. The machines are built in lots on the jig system and all parts are interchangeable. The skillful planning of a plant to produce a specialty is adroitly handled in the pamphlet and there are many halftones with descriptions of machines and attachments.

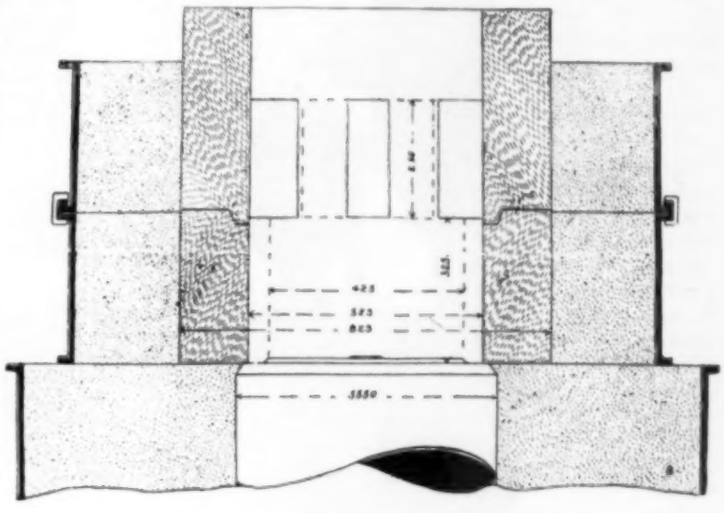


FIG. 2.—SHOWING SECOND MOLD IN POSITION.

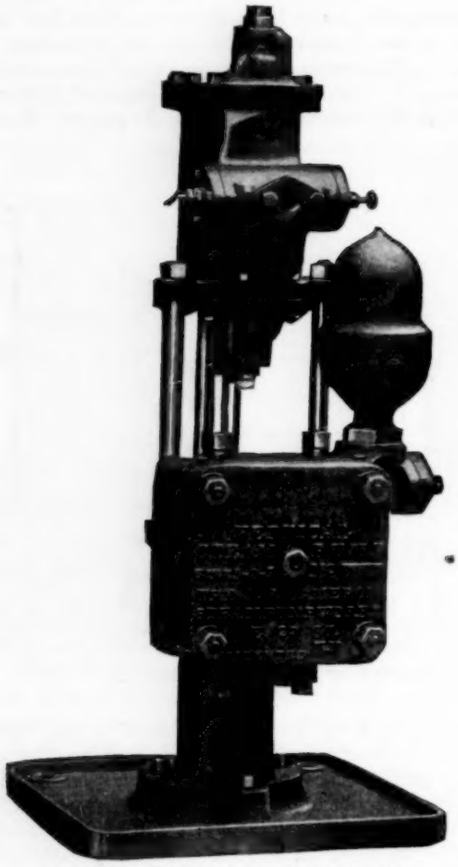
Catalogue B, distributed by the Mesta Machine Co., of Pittsburg, is an elaborate exposition of production values. In the mere matter of size, a magnitude of little consequence compared with other features, the book is impressive. It is 9 x 12-in., with many full page illustrations of attractive quality. The product of the plant is shown by numerous halftones of Corliss and piston-valve engines, rolling mill machinery, steel, sand and chilled rolls; steel castings and machine molded gears. These illustrations are supplemented by generous views of the works. These constitute so thorough a story of the shop facilities for manufacturing that the book is within "measurable distance" of a personally conducted tour through the plant. The shop equipment is interestingly presented and the book is substantially bound, neatly printed and well worth preservation.

Goff, Horner & Co., Ltd., of Pittsburg, have a booklet of "Muskingum" steel sheets from Bessemer and open-hearth stock. The pamphlet is conveniently arranged and the tables are in suitable shape for easy reference.

BOILER FEED PUMPS.

The Iron Trade Review of recent date had a sectional view and description of the Cameron steam pump. The illustration now given shows the vertical pump for boiler feeding made by the same firm, the A. S. Cameron Steam Pump Works, of New York. The halftone depicts a plain unpretentious vertical piston pump on base. This direct-acting steam pump occupies but little space and has high capacity in proportion to the room required. It is shown on a base plate, but for marine use it is sometimes preferable to bolt the pump to the bulkhead by means of lugs cast on the back. This has been done in the case of pumps of this type furnished to the smaller gunboats and which have seen quite active service in the United States navy.

In common with all Cameron pumps, no working part is exposed except a small portion of the rod which may also be



CAMERON VERTICAL BOILER FEED PUMP.

covered if this is advisable. The steam end can be adapted to work at any steam pressure, and the water end is fitted with the Cameron patent priming valves. The water end has a removable bushing or lining which can be taken out and replaced with a new one in a few minutes and thus avoid any delay when it becomes necessary to renew the working barrel of the cylinder on account of wear.

In the suit of the Cleveland Pneumatic Tool Co., appellant, against the Chicago Pneumatic Tool Co., brought by the latter company, and appealed from the United States Circuit Court at Pittsburg, the Circuit Court of Appeals in Philadelphia has rendered an opinion reversing the lower court. The Chicago company charged infringement of a patent on a pneumatic tool handle, and won in the lower court, but the decision of the higher court holds there was no infringement.

PRODUCTION OF OPEN-HEARTH STEEL IN 1904.

The American Iron and Steel Association has received complete statistics of the production of open-hearth steel in the United States in 1904. The production was larger than in 1903 or in any preceding year.

The total production of open-hearth steel ingots and castings in the United States in 1904 was 5,907,666 gross tons, against 5,829,911 tons in 1903, an increase of 77,755 tons, or 1.3 per cent. The following table gives the production of open-hearth ingots and castings by States since 1901.

States—Gross tons.	1901.	1902.	1903.	1904.
New England	170,876	179,923	169,209	195,901
N. Y. and N. J.	82,985	92,763	104,598	165,986
Pennsylvania	3,594,763	4,375,364	4,442,730	4,306,498
Ohio	184,943	278,854	369,349	480,406
Illinois	.....	341,073	17,142	358,215
Other States	244,220	325,364	321,106	400,660
Total	4,656,309	5,687,729	5,829,911	5,907,666

The open-hearth steel made in 1904 was produced by 115 works in 16 states—Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Tennessee, Alabama, Ohio, Indiana, Illinois, Wisconsin, Missouri, Colorado, and California. One hundred and eleven works in 17 state made open-hearth steel in 1903.

The production of open-hearth steel ingots in 1904, excluding castings, amounted to 5,605,332 gross tons, against 5,429,563 tons in 1903, an increase of 175,769 tons.

In 1903 4,734,913 tons of open-hearth steel were made by the basic process and 1,094,998 tons were made by the acid process, while in 1904 the production by the basic process amounted to 5,106,367 tons and by the acid process to 801,299 tons. In the following table the production by states of both acid and basic open-hearth steel ingots and castings in 1904 is given.

States—Gross tons.	Basic open hearth steel.	Acid open hearth steel.	Total gross tons.
New England	147,390	48,511	195,901
New York and New Jersey	139,791	26,195	165,986
Pennsylvania	3,667,673	638,825	4,306,498
Ohio	427,948	52,458	480,406
Illinois	341,073	17,142	358,215
Other States	382,492	18,168	400,660
Total	5,106,367	801,299	5,907,666

There was a decrease in the production of acid steel in 1904 as compared with 1903 of 293,699 tons, or over 26.8 percent, but an increase in the production of basic steel of 371,454 tons, or over 7.8 percent.

The total production of open-hearth steel castings in 1904, included above, amounted to 302,334 gross tons, of which 98,919 tons were made by the basic process and 203,415 tons were made by the acid process. In 1903 the production of open-hearth steel castings amounted to 400,348 tons, of which 134,879 tons were made by the basic process and 265,469 tons by the acid process. The decrease in direct castings in 1904 as compared with 1903 amounted to 98,014 tons. The following table gives the production of open-hearth steel castings by the acid and basic processes in 1904 by states.

States—Gross tons.	Basic castings.	Acid castings.	Total, gross tons.
New Eng., N. Y. and N. J.	17,193	27,285	44,478
Pennsylvania	5,831	128,579	134,410
Ohio, Ill., and other states	75,895	47,551	123,446
Total	98,919	203,415	302,334

At the meeting of the stockholders of the Dimmick Pipe Co., held a few days ago at the company's offices in Birmingham, Ala., it was voted to increase the capital from $200,000 to $500,000 with $1,000,000 authorized. The company is making extensive improvements which have been described in these columns. The old board of officers and directors was re-elected.

NEED OF A PATENT COURT.

To the Editor:

I have read with much satisfaction your article entitled "A Court of Patent Appeals," in *The Iron Trade Review* of March 2. The necessity for a special court for the trial of patent cases has been appreciated for years, and many efforts have been made to secure the establishment of such a court, but so far in vain.

The reasons why such a court is needed are apparent to those familiar with the subject. In the first place, the property right in a patent differs from all other kinds of property, in that it is of a limited duration. It exists but for seventeen years, and hence the necessity for a speedy and less expensive means for determining and protecting the right. Second, if the invention proves to be one of much value, the patent is sure to be largely infringed. Speaking on this point, Judge Holt, in his report in 1857, said:

"While this species of property yields to none other in its national importance, and surpasses all others in the amount which it pays for the legal safeguards thrown around it, it is notorious that it enjoys but a precarious and incomplete protection. The more prominent of the causes conducing to this result are the helplessness of inventors as a class; the peculiarly exposed character of their interests to be defended; the universal impatience of legal restraints, as manifested in that lawlessness which so sadly mars the times in which we live; and lastly, the unskillful adjustment of subsisting instrumentalities to the performance of those duties of guardianship which the government has assumed upon itself. If the law relaxes the vigilance of his watch over the homestead of the citizen, he can take his stand on his own threshold, and with his own right arm beat back those who would invade it; but the rights of the inventor are co-extensive with the limits of the republic, and may be assailed and despoiled at a thousand points at the same moment of time. The eyes of Argus would not suffice to discover, nor the arms of Briareus suffice to resist the assaults of so omnipresent a foe as it is his lot to encounter. If, then, the faith which the government has plighted with him fails, he is utterly without shelter. This is no stretch of the imagination. Again and again have inventors, impoverished in fortune and broken in spirit, come to this office seeking the extension of their patents, and demonstrating by testimony, that the term of the patent which should have been devoted to reaping the harvests of their labors were worse than wasted in harassing and ruinously expensive litigation in defense of their patented privileges. The insolence and unscrupulousness of capital, subsidizing and leading on its mercenary minions in the work of pirating some valuable invention held by powerless hands, can scarcely be conceived of by those not familiar with the records of such cases as I have referred to. * * * * * It is a principle of criminal jurisprudence that the penalty shall be proportioned in its severity to the temptations and facilities which exist for the commission of the crime. The principle is a sound one, and would justify legislation of unusual rigor in behalf of the downtrodden interests of inventors."

That the present means for defending the rights of patentees or the owners of patents, is deficient is not so much the want of severity in the penalties, as in the existing means for determining those rights and enforcing the penalties, is well recognized. The trouble is in the want of better means for applying the law. Our present courts are inadequate for that purpose—not that they lack in legal ability or probity, but they have not that special knowledge of the subject matter necessary to enable them to act understandingly. In the words of Justice Story, "the patent law is the metaphysics of our law," and properly to understand, construe and apply it to the multiplicity and variety of inventions, embracing as they do, every art and science known to man, requires something more than legal knowledge.

In the present day, when models have been abolished, and drawings alone are relied upon to show how the machine is constructed and operates, and the drawings consist of several sheets, each showing detached parts of the machine, how is a judge, who as Commissioner Leggett said, cannot read a drawing, to understand it? Not only that, but in a suit for infringement, anywhere from one to a dozen equally complicated machines are set up by the defendant, all of which it is equally necessary for the court to understand in order to decide intelligently and justly. Is it not therefore obvious that something more than mere legal knowledge, no matter how profound that may be, is required to do justice in such cases? In patent cases the court must rely upon the representations of the opposing counsel, and the testimony of the experts of the opposing parties, and who, as Judge Benedict said, testified directly opposite to each other and therefore did not aid him at all.

It is for these reasons that, as was said by Commissioner Leggett in 1874, "it is well known to every patent owner and to every patent attorney who has ever been in court, that it is exceedingly difficult to get our judges to touch patent cases. They dread them as they do the smallpox. Most of them have a perfect horror of patent cases. And why? Not because they are incompetent judges. They are learned in the law; they are eminent jurists; but to try a patent case needs something more than legal lore and judicial wisdom. It calls for the thorough knowledge of the applied sciences and practical arts, a clear preparation of mechanical principles, and familiarity with practical mechanics.

"It so happens that the school in which the lawyer is educated and developed, leads him, in ninety-nine cases in a hundred, out of the channel where this education and this knowledge are to be obtained. Unless you can add to the lawyer and the jurist, a scientific mechanic's head, you have not a first-class patent lawyer, nor a first-class patent judge, and there can be no certainty as to what kind of a judgment you will get, let your case be good or bad, and in saying this I do not mean to disparage our judiciary. Our judges have not been selected because of their fitness for this special work. As a result, a judge in Chicago will make a decision today, and a judge in Boston will decide to the contrary tomorrow."

Said Judge Nott, on the same occasion: "Now this being the state of the case, this the field, these the evils, it seems that sooner or later there must be a remedy. We may not be prepared for it, but we need a tribunal of patents, sitting within the shadow of the patent office—a tribunal which shall have these two great ends in view—certainty and expedition."

As showing the necessity for this, in addition to the case of Hanifen vs. Armitage referred to in *The Iron Trade Review*, I would cite the case of the "driven well." In that case there were eight decisions in the circuit courts of various states, and two in the Supreme Court. In seven of the cases in the circuit courts the patent was sustained. In the first case in the Supreme Court, the court stood four to four (there being a vacancy at the time on the bench) and that of course left standing the decision below, which sustained the patent.

In the case of Andrews *et al* vs. Hovey, in which six thousand different parties in the states of Minnesota and Iowa were involved, counsel agreed that the decision in the one case should govern all. It was tried in the Southern district of Iowa, before three judges, Love, Shiras and Nelson, two of whom held that the patent was void and the third that it was valid. In the final decision by the Supreme Court, that tribunal held that the patent was void because of more than two years public use of the invention prior to Green's application for the patent—the identical ground on which the writer opposed the grant before the patent office, and the District Court! The litigation extended over a period of ten years, costing an enormous sum, and the final decision was rendered two years and four months after the patent had expired!

When we bear in mind the fact that there is scarcely any business in the country, either manufacturing or agricultural, which does not use patented machines or articles of one kind or another, it will readily be seen that this is a matter of the

utmost importance. It is a small concern that does not have $100,000 invested in its business, and from that up to five, ten, fifteen or even twenty millions. It is of vital importance to them to know what their rights are; for if they are infringing they do not want to go on piling up the damages, and on the other hand they cannot afford to stop their business and let their capital lie idle. So, too, it is of equal importance to the owner of a plant to know whether his patent is or is not valid, and whether it is or is not being infringed, and the only way to settle these matters is to have a patent court composed of judges specially qualified for the purpose of deciding all such cases—men who can practically be their own experts, and can thus decide cases in the shortest possible time, and with the least possible expense to all concerned. If Congress will only enact the law, such men can be found, if only the President will not be controlled by the politicians in making the appointments.

The plan suggested by the committee of the American Bar Association of detailing judges for limited periods from the existing courts, is objectionable for many reasons, which are explained at the hearing before the House Committee. What is wanted is a permanent court, composed of judges having the qualifications above mentioned—a special court whose time and attention shall be devoted entirely to patent causes. If the manufacturers and others interested will but combine and bring their influence to bear on Congress, it can be had, and it would be a blessing to all concerned—not alone to those interested in patents, but to the public at large, as was well illustrated by the drive well and the barbed wire cases.

W. C. DODGE.

Washington, D. C.

PIG IRON BY GRADES IN 1904.

The *Bulletin* of the American Iron and Steel Association for March 15 gives interesting statistics of the distribution of the output of 1904 among the various descriptions of pig iron. The table below shows the production of pig iron in 1903 and 1904 by grades in gross tons:

Grades—Gross tons	1903	1904
Bessemer and low-phosphorus	9,989,908	9,098,659
Basic pig iron made with min. fuel	2,040,726	2,483,104
Forge pig iron	783,016	550,836
Foundry and high silicon	4,409,023	3,827,229
Malleable Bessemer pig iron	473,781	263,529
White, mottled, and miscellaneous	120,137	53,284
Spiegeleisen	156,700	162,370
Ferro-manganese	35,961	58,022
Total	18,009,252	16,497,033

The Bessemer figures include low-phosphorus pig iron, that is, iron running below 0.04 percent in phosphorus. Pig iron containing from 0.04 to 0.10 percent of phosphorus is classified as Bessemer. The basic figures are confined strictly to pig iron made with mineral fuel. A few thousand tons of castings direct from the furnace are included in the totals for white and mottled and miscellaneous grades of pig iron for 1903 and 1904. Ferro-silicon and high-silicon pig iron are included in the foundry figures.

Of the total production of pig iron in 1904 over 55.1 percent was Bessemer and low-phosphorus, as compared with over 55.4 percent in 1903; nearly 23.2 percent was foundry, against 24.4 percent in 1903; 15 percent was basic, against over 11.3 percent in 1903; 3.3 percent was forge, against 4.3 percent in 1903; 1.3 percent was spiegeleisen and ferro-manganese, against 1.06 percent in 1903; and nearly 1.6 percent was malleable Bessemer, again 2.6 percent in 1903. The production of white and mottled and miscellaneous grades of pig iron and of castings made direct from the furnace amounted to less than 1 percent in both years.

In 1904 the production of low-phosphorus pig iron amounted to 190,946 tons, against 200,422 tons in 1903. In 1904 low-phosphorus pig iron was made in New York, Pennsylvania and Tennessee. The following table gives the roduction by States of Bessemer and low-phosphorus and basic pig iron in 1903 and 1904:

States—Gross tons.	Bess. and low-phos. 1903.	Bess. and low-phos. 1904.	Basic pig iron. 1903.	Basic pig iron. 1904.
New York	129,323	250,483	34,516	1,233
New Jersey	.....	.....	83,286	112,455
Pennsylvania	5,213,143	4,511,999	1,417,253	1,805,747
Maryland	321,784	292,642	.....	.....
Virginia	1,000	.....	90,543	45,742
West Va.	198,688	267,505	.....	.....
Tennessee	26,856	25,209	5,176	.....
Alabama	2,299	.....	172,280	273,587
Ohio	2,422,676	2,138,442	190,840	179,560
Illinois	1,386,683	1,424,030	.....	53,338
Michigan	3,520	17,976	.....	.....
Wisconsin	74,080	37,287	.....	.....
Minnesota	33,740	20,768	.....	.....
Missouri	.....	.....	17,000	11,442
Colorado	176,116	112,318	29,832	.....
Total	9,989,908	9,098,659	2,040,726	2,483,104

A small quantity of charcoal basic pig iron is not included in the basic figure. The production of foundry and forge pig iron by States in 1903 and 1904 was as follows, in gross tons:

States—Gross tons.	Foundry pig iron. 1903.	Foundry pig iron. 1904.	Forge pig iron. 1903.	Forge pig iron. 1904.
Mass.	3,265	3,149	.....	.....
Connecticut	14,501	8,922	.....	.....
New York	304,667	281,419	37,986	33,675
New Jersey	85,257	103,454	25,750	32,071
Pennsylvania	948,957	840,407	433,925	297,307
Maryland	2,460	799	326	.....
Virginia	413,403	253,812	29,551	9,918
West Va.	43	13	.....	3,427
Kentucky	98,600	36,297	2,453	600
Tennessee	350,966	253,185	23,159	19,743
North Car.	6,779	.....	619	.....
Georgia	59,910	52,658	5,765	8,824
Texas	11,408	5,100	.....	.....
Alabama	1,194,556	1,085,935	155,937	76,850
Ohio	416,850	459,354	61,904	66,148
Illinois	115,223	107,236	5,641	.....
Michigan	239,369	201,849	.....	.....
Wisconsin	112,656	113,180	.....	2,273
Mo., Col. and Wash.	30,153	20,460	.....	.....
Total	4,409,023	3,827,229	783,016	550,836

Included in the 3,827,229 tons of foundry pig iron made in 1904 are 69,730 tons of ferro-silicon, produced in Pennsylvania, Virginia, West Virginia, Kentucky and Ohio, a small part of which was made with electricity. In 1903 51,516 tons of ferro-silicon were made. Pig iron containing 7 percent of silicon and over is classified as ferro-silicon. Virtually all the charcoal pig iron made is classified as foundry pig iron. Alabama is now the leading producer of foundry pig iron and Pennsylvania of forge.

The production of malleable Bessemer pig iron in 1904 amounted to 263,529 tons, against 473,781 tons in 1903. In 1904 the production of white and mottled and other miscellaneous grades of pig iron and direct castings amounted to 53,284 tons, against 120,137 tons in 1903.

The production of spiegeleisen and ferro-manganese by States in 1903 and 1904 was as follows, in gross tons:

States—Gross tons.	Spiegeleisen. 1903.	Spiegeleisen. 1904.	Ferro-manganese. 1903.	Ferro-manganese. 1904.
New Jersey	15,346	11,242	.....	.....
Pennsylvania	76,493	103,773	34,871	57,076
Tennessee	.....	.....	.....	946
Alabama	24	.....	1,090	.....
Illinois	57,955	39,799	.....	.....
Colorado	6,882	7,556	.....	.....
Total	156,700	162,370	35,961	58,022

The figures given for ferro-manganese for 1904 include a small quantity of ferro-phosphorus made in Tennessee. Ferro-phosphorus was not reported for 1903, but a small quantity was reported by Alabama in 1902. Spiegeleisen usually contains from 9 to 22 percent of manganese, and ferro-manganese from 45 to 82 percent.

PERSONAL.

John Reis, district manager of the New Castle, Pa., plants of the Carnegie Steel Co., Pittsburg, has been appointed assistant to president Corey of the United States Steel Corporation. Mr. Reis has been connected with iron and steel works in the New Castle and Youngstown districts for many years, and his new appointment will mean his removal from New Castle to New York about April 1.

Wm. G. Mather, president of the Cleveland-Cliffs Iron Co., will deliver the annual class day address before the Michigan School of Mines, Houghton, Mich., on May 5.

F. G. Tallman has resigned as manager of the Brown Hoisting Machinery Co., Cleveland.

Wm. A. Douglass, long connected with the advertising department of the *Iron Age* in Chicago territory, has removed to the Pacific coast to engage in business.

Charles A. Gates, for many years officially connected with Russell & Co., of Massillon, O., for most of the time as manager, has resigned. He will spend some months abroad.

Charles Winshall has resigned the presidency of the Standard Wheel Co., Terre Haute, Ind., in order to devote his time to other interests. J. H. Keyes has been elected to fill the vacancy.

Wesley R. Mason has been promoted to the position of district manager at the Detroit shops of the American Car & Foundry Co., as successor to George Hargreaves, resigned. Mr. Mason, although a young man, has been connected with the company 17 years.

Carl S. Breckenridge, formerly of Toledo, O., has been made district manager of the American Can Co., with headquarters in Chicago.

Michael Hanley, superintendent of the Indiana rolling mill of the Republic Iron & Steel Co., Muncie, Ind., has resigned. Mr. Hanley had been connected with the company about four years.

Vice President Clyde M. Carr of Joseph T. Ryerson & Son, Chicago, is taking a rest at Pasadena, Cal. He will return to Chicago about May 1.

President F. E. Reed of the F. E. Reed Co., Worcester, Mass., is sojourning in California for the benefit of his health.

W. L. Brown, president of Pickands, Brown & Co., Chicago, has left for California, where he will remain until May.

Frank N. Kneas, assistant sales agent of the Cambria Steel Co., at its Chicago office, handling the sales of structural steel and plates, has severed his connection with that company to enter general engineering practice in New York. Harvey H. Cosley, for several years connected with the structural steel department of the Illinois Steel Co., at its North works, Chicago, succeeds Mr. Kneas as assistant to Clifford J. Ellis, sales agent.

Alfred M. Marshall, president and general manager of the Marshall & Huschart Machinery Co., Chicago, has bought the interest of Frank H. Huschart in the company. William H. Reid, who has been with the firm for several years, succeeds Mr. Huschart as secretary and treasurer.

Wm. Vorherr has been promoted to the position of chief clerk at the Canal Dover plant of the American Sheet & Tin Plate Co., to fill the vacancy caused by the resignation of A. N. Flora.

E. R. Peckans, superintendent of the yard department of the Lackawanna Steel Co., Buffalo, has resigned, and has been succeeded by E. G. Bowen, his assistant. Mr. Peckans will take an extended trip through the South. It was with regret that the company accepted his resignation.

David W. Hawksworth, for seven years mechanical engineer for the American Car & Foundry Co., Detroit, has been appointed assistant manager for the Detroit plants.

T. Scott Clingan, night mill superintendent of the Valley plant of the Republic Iron & Steel Co., Youngstown, O., has been appointed assistant to Superintendent J. W. Deetrick of the plant.

James Simpson, master mechanic for the National Tube Co., has been appointed superintendent of construction in connection with the building of the new tube plant by the company at McKeesport, Pa.

C. B. Murray, for many years chief chemist of the Carnegie Steel Co., at their Edgar Thomson Works, has associated himself with G. P. Maury in the active management of the Metallurgical Laboratory, 611 Bailey-Farrell building, Pittsburg.

E. N. Dickson, purchasing agent of the Allis-Chalmers Co., Milwaukee, Wis., will sever his connection with that company April 1, to go with the Milwaukee Coke & Gas Co. No successor to Mr. Dickson has yet been appointed.

Horace Stocker, until recently a member of the firm of McDowell, Stocker & Co., machinery dealers, South Canal street, Chicago, has organized the H. A. Stocker Machinery Co. He has leased the premises at 20 and 22 So. Clinton street, Chicago, and will erect on same a $25,000 manufacturing building for the use of his company.

Ward W. Willits, president, Adams & Westlake Co., left for a vacation in Europe last month, where he will remain until the middle of May.

A partnership known as William B. Walter & Co. has been formed between William B. Walter, formerly salesman with the American Rolling Mill Corporation, Chicago, and L. V. Calhoun, until recently purchasing agent of the Chicago Railway Equipment Co., Chicago. The company has established offices in the Marquette building and will do a brokerage business in iron and steel products, gray iron, steel and malleable castings, etc.

C. E. Louis, 541 The Rookery, Chicago, pig iron and coke agent, has purchased the brokerage business formerly conducted by B. M. Gardner in finished iron and steel products, castings, machinery, etc. E. G. Aldrich, formerly connected with the purchasing department of the Allis-Chalmers Co., will be associated with Mr. Louis and will have the management of this department.

M. J. Moore, for a number of years chief chemist at the Joliet, Ill., works of the Illinois Steel Co., has been appointed assistant to the superintendent of blast furnaces at Joliet.

W. H. Whiteside, who has been the general sales agent of the Allis-Chalmers Co., has been elected vice president and general manager of the company. The position of general manager is a new one. Mr. Whiteside, in performing his new functions, will represent both the financial and mechanical interests of the company. His headquarters will probably be in New York and he will also have an office in Milwaukee. The report widely published in connection with the announcement of Mr. Whiteside's election, that W. J. Chalmers has resigned as vice president of the company, is denied on excellent authority.

Building not only goes on uninterruptedly in all sections of the country, but it shows a remarkable increase over the corresponding period a year ago. Twenty-five of the principal cities show an increase of 55 percent for February over the same month a year ago. During the month just closed permits were taken out in these cities, according to official reports to *Construction News*, for the construction of 4,902 buildings, aggregating in cost $22,502,806, against 4,203 buildings at an estimated cost of $14,517,065 for the same month a year ago, an increase this year of 699 buildings, $7,985,741, or 55 percent in cost. The increase for January was 83 percent. It will be observed that the increase of the preceding months is fairly well maintained. Only eight cities show decreases.

Templeton Kenly & Co., 33 Ontario street, Chicago, Ill., have bought the plant of the Sykes Steel Roofing Co., at 15th and Morgan streets, Chicago, and will remove it to the former company's present location.

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THE STEADY INCREASE IN OPEN-HEARTH STEEL.

The march of the basic process for the manufacture of open-hearth steel in the United States is probably the subject of more frequent comment than any other single development in the iron industry. But the statistics for 1904 giving the production of Bessemer and open-hearth steel present more sharply than those for any other year the contrast between the records of the converter and the open-hearth furnace. They show that while the production of Bessemer steel ingots declined 733,689 tons, or from 8,592,829 tons in 1903 to 7,859,140 tons in 1904, the output of open-hearth steel increased by 77,755 tons, or from 5,829,911 tons in 1903 to 5,907,666 tons in 1904. This latter increase was due to the expansion in the basic open-hearth steel industry which amounted to no less than 371,454 tons in the year, enough to more than offset the decline of 293,699 tons in the output of acid open-hearth steel.

It is significant that no column of figures, representing production of any description of iron or steel in the United States over a series of years shows the unbroken record of increase, year after year, that is exhibited by the statement of output of open-hearth steel ingots and castings. Pig iron and Bessemer steel have their ups and downs—their periods of expanding production, followed at intervals by a falling off, so that the output in a particular year will be lower than in the year preceding. The same is true of rails and of the various other forms of finished material. The advance to new records of output is not a regular nor is it an uninterrupted progress. We have brought together the figures in the table below for the purpose of emphasizing the exception in the case of open-hearth steel—and this characteristic of the open-hearth steel figures, it should be noted, is due almost entirely to the rapid extension of the basic process. The third column in the table gives the production of basic open-hearth steel in the years for which separate statistics for the basic product were gathered by the American Iron and Steel Association. The estimate for 1890 is taken from the report of the association for that year:

PRODUCTION OF STEEL IN THE UNITED STATES—GROSS TONS.

	Bessemer Steel	Open-Hearth Steel	Basic O. H. Steel
1890	3,688,871	513,232	est. 80,000
1891	3,247,417	579,753	.....
1892	4,168,435	669,889	.....
1893	3,215,686	737,890	.....
1894	3,571,313	784,936	.....
1895	4,900,128	1,137,182	.....
1896	3,919,906	1,298,700	776,256
1897	5,475,315	1,608,671	1,056,043
1898	6,609,017	2,230,292	1,569,412
1899	7,586,354	2,947,316	2,080,426
1900	6,684,770	3,398,135	2,545,091
1901	8,713,302	4,656,309	3,618,993
1902	9,138,363	5,687,729	4,496,533
1903	8,592,829	5,829,911	4,734,913
1904	7,859,140	5,907,666	5,106,367

Panics, depressions, labor troubles, short crops, and all the vicissitudes they have brought into the iron trade, have been promptly reflected in Bessemer steel as they have in the pig iron industry; but none of these things has once interrupted the onward march of basic open-hearth steel. Its record is in this respect unparalleled in the annals of the world's iron trade.

Not only is it true that open-hearth steel has enlarged its place in the lines in which it has furnished the bulk of the tonnage for a number of years—plates, structural shapes, steel castings and forgings—but it is now contributing an increasing share of the output of rails, bars, sheets, tinplates and wire products. This may be considered a virtual displacement of Bessemer steel, since all these products, with the exception of bars, have until very recent years, been the peculiar field of the Bessemer converter.

It should be noticed in the table above that whereas Bessemer steel fell off nearly 1,300,000 tons from 1902 to 1904, basic open-hearth steel in the same interval increased 610,000 tons. From being 12 percent of the total of Bessemer and open-hearth steel in 1890, the open-hearth product had come up to 34 percent in 1900, 35 percent in 1901, 38 percent in 1902, 40 percent in 1903 and 43 percent in 1904. It is noteworthy also that the decline of 546,000 tons in Bessemer steel ingot production in 1903, as compared with 1902, was not due to a cutting down of the Bessemer steel rail output, the latter having been even slightly greater in 1903 than in 1902—2,946,756 tons, as against 2,935,392 tons.

The increase in open-hearth steel production last year over 1903 was in spite of a decline in the output of steel foundries. As shown in the statistics printed elsewhere in this issue, the output of open-hearth steel castings in 1904 fell off from 400,348 tons to 302,334 tons, or about 25 percent.

On the question of scrap supply for open-hearth steel manufacture the figures give some information that is interesting. As has been pointed out heretofore in these columns, pig metal is entering more largely

in the past few years into basic open-hearth mixtures—due in the case of some of the smaller plants to the increasing scarcity of scrap and at the larger works to the taking of direct metal from furnaces and the increased use of processes employing all or nearly all pig iron. In 1896, the first year for which basic open-hearth steel statistics were gathered, the production of basic pig iron was 43 percent of the production of basic steel; in 1900 it was 42 percent; in 1901 it was 40 percent; in 1902 it had jumped to 45 percent, and last year it was 48.6 percent.

A steadily increasing use of non-Bessemer ores, both actually and proportionately, is pointed to by the last three lines in the statistical table given above, as well as by the known developments in construction of Bessemer and open-hearth plants and the market demand for Bessemer and open-hearth material.

THE FACTS ABOUT INDUSTRIAL ENTERPRISES.

During the past five years there has been a very large growth in the attention given to business interests, and especially consolidations, by the daily press, magazines and public officials. Multitudinous articles and reports have been published, with widely varying degrees of merit. Many of these articles are written by persons who know little about the subjects on which they write, and are intended to promote local enterprises, some of which have merit while others are the merest swindling schemes. An example of the ignorance displayed by these writers was furnished a few days ago by a Western newspaper which stated that "ores of the Mahoning Valley analyze 86 percent pig iron." Another class of contributions to periodicals is highly sensational, distorting facts and often indulging in malicious inventions in order to wreak revenge by damaging business or individual reputations. Conscienceless publishers, if they succeed in causing a sensation, care little whether they build up unworthy enterprises or tear down legitimate business interests.

On the other hand, however, there is a greater amount of thorough, conscientious investigation of business problems today than at any time. Some of the work of magazine contributors is highly creditable and a few daily newspapers are handling industrial news more carefully and discussing matters of business principle and policy more intelligently. Public officials have done so little toward investigating great companies that it is hardly fair to expect them to avoid serious errors; for until the Department of Commerce was established, about the only governmental effort in this direction was expended in spasmodic Congressional investigations by representatives and senators who had little, if any, special information on the subjects investigated. A long step in advance was taken in the establishment of the new department, and while much of its work has been tentative, possibilities of great results are clearly indicated, especially by the excellent report recently submitted to Congress by Mr. James R. Garfield, chief of the bureau of corporations, on the so-called beef trust. Without attempting to pass upon the accuracy of all the conclusions, we have confidence in the integrity and courage of Mr. Garfield, whose report gives evidence of just such a thorough investigation as we should expect him to make. The report shows that the public has been misinformed to a large extent concerning the packing companies. Because Mr. Garfield declares that certain profits are small, he is called a credulous young man by those who have been fighting the packers; but he has been brave enough to state the facts as he found them. He has thrown a vast deal of light upon the operations of an important industry and in so doing has rendered an important public service. By such painstaking inquiries, conducted in a spirit of fairness to all concerned, we may hope to prevent wanton assaults upon business interests from having disastrous consequences, and prepare the way for the establishment of better conditions.

The Brotherhood of Locomotive Engineers, in revoking the charter of the New York union whose members violated their contract with the Interborough Co. by going on a strike, has set an example which, if followed generally by labor unions, would go far toward establishing more satisfactory conditions between capital and labor. This prompt punishment of those who violated their contract will cause much suffering by depriving the men of strike benefits estimated at $200,000, but it is nevertheless worthy of highest commendation and ought to be of very great value in promoting sentiment in favor of rigid adherence to contracts. The irresponsibility of unions is one of the commonest criticisms of employers, and not infrequently violations of agreements are due to insubordination of the rank and file rather than to the duplicity of labor leaders. Yet how frequently is it the policy of union officers to condone such assaults upon discipline and thereby invite disobedience of the next unpalatable order. In more than one respect the Brotherhood of Locomotive Engineers has set an example which the great majority of unions have been all too loath to follow. They look askance upon its conservatism and because of it call the Brotherhood a union with unionism left out.

The firm of Runyon, Fairbank & Co., of Cleveland, has been organized to do a jobbing business in iron ore, pig iron, coal and coke. It is composed of W. C. Runyon, Geo. L. Fairbank and A. Grossman. Mr. Runyon is president of the Struthers Furnace Co. Mr. Fairbank is secretary and Mr. Grossman is treasurer of the same company, with which they have been connected for a number of years. The offices are at 1106 Citizens' building, Cleveland. The new firm is already engaged in active business.

George Whiting Co., Chicago, manufacturer of punches, shears and bending rolls, has been forced by increasing business, to move its shop from 428-448 North Halsted street to a larger plant at 156-164 West North avenue, Chicago. The company will move into its new premises May 1.

The Labor Situation.

SUIT WON BY THE NATIONAL FOUNDERS' ASSOCIATION.

A suit of considerable importance, involving the right of an association of manufacturers to collect dues from members, was decided at Akron, O., a few days ago. The plaintiffs were J. H. Webster and others, members of the fourth district committee of the National Founders' Association, and the defendants were Taplin, Rice & Co., of Akron. The suit was brought to collect dues and assessments which it was claimed were due from the defendants to the National Founders' Association. The defendants demurred, setting up that the National Founders' Association being a partnership, it could not bring suit against members, who were partners. The common pleas court sustained this demurrer, but the circuit court reversed the decision, and the case went back to the trial court to be heard on its merits. The principal defense set up by the defendants at the trial last week was that under the by-laws of the National Founders' Association, when dues or assessments are unpaid and the association makes a draft on a member, membership is forfeited if the draft is not honored. As in the case of the defendants the draft was not honored, they claimed that their membership was thereby terminated. One day was consumed in the taking of evidence, and the next by the attorneys in presenting arguments. After being out a short time the jury returned a verdict in favor of the plaintiffs to the amount of $1,182.62, the defendants to pay the costs. It is expected that the case will not be finally disposed of until heard by the supreme court of the State.

MOLDERS' UNION STRIKE BENEFITS.

It is stated on apparently good authority that the Iron Molders' Union has ceased paying strike benefits to the striking union molders at Worcester, Mass. Recently the officers of the local union have been placing some of the strikers in union foundries at other points. It is understood that the strikes of the past two years have nearly depleted the accumulated funds of the union. The strikers at Worcester were instructed by the union to "hang together."

The *Iron Molders' Journal* says that strike benefits paid by the molders' union amounted to $102,593.36 in 1901, $135,440.75 in 1902, $185,079.80 in 1903 and $266,283.43 in 1904.

METAL TRADES ASSOCIATION.

CINCINNATI, March 14.—The Metal Manufacturers' Association of Philadelphia held a well attended dinner on March 9. About one hundred members and guests were present. Addresses were made by Mr. Leach, president of the Textile Manufacturers' Association, Commissioner W. P. Eagan of the National Metal Trades Association, and H. C. Hunter secretary of the New York Metal Trades Association.

The Foremen's and Superintendent's Club, which is composed of the employes of the members of the Chicago Metal Trades Association, will hold its next regular meeting on April 8.

The strike in the polishing department of the S. L. Allen Co. of Philadelphia has completely collapsed.

The Rose Manufacturing Co. of Philadelphia reports that the new men taken on since the strike are turning out more work than the men who struck.

The executive committee of the St. Louis Metal Trades Association has called a general meeting of the association for Thursday, March 16.

The St. Louis members of the N. M. T. A. will attend the convention in Chicago in a body. The Wabash railway has reserved a special car for their use.

Secretaries D. H. McPherson of the Manufacturers' Association of Philadelphia and H. C. Hunter, of the New York Metal Trades Association are arranging for a special car for the accommodation of the members of their respective associations who will attend the Chicago convention. Indications are that there will be a large representation from the membership of these associations.

Paul C. Benedict, District Passenger Agent of the C. H. & D. R. R. has arranged for a special car to Chicago for the use of the members of the Cincinnati District.

Harry Gaul, district passenger agent of the L. S. & M. S. is making arrangements for a special car for the members of the 9th or Cleveland district to attend the convention.

The members of the second district of the N. M. T. A. held their annual district meeting at Worcester, Mass., March 8. It was a most enthusiastic one and did not adjourn until after 7 o'clock. Members were in attendance from all over the district.

The alumni dinner of the N. M. T. A. will be held at Union League Club in Chicago on the evening of March 22. It is now assured that the dinner will be participated in by about 25 or 30 members and ex-members of the administrative council and officers and ex-officers. Mr. Covell will preside as toastmaster.

LABOR NOTES.

The nine men who went out at the Page-Storms Drop Forge Co.'s plant, Chicopee Falls, Mass., returned on the same conditions as existed before the strike. One union drop forger refused to joint the union at an expense of $25, and the union men attempted to force the issue. No concession was made by the firm.

The International Association of Machinists is offering special inducements to new members and making every effort to increase the membership in the New York district.

An attempt is being made in the New York Assembly to have a bill passed which is an amendment to Section 603 of the code of civil procedure. This applies to injunctions by courts of competent jurisdiction. The proposed bill would prevent the court from giving immediate relief, by granting a temporary injunction, requiring it first to give notice to the defendants. This would allow strikers to do their work of intimidation and violence and the court could only act after the fact.

In the week ending March 11 the Worcester, Mass., Labor Bureau supplied men for 93 positions, the list including toolmakers, general machinists, repair hands, lathe, drill, setting up and planer hands, engineer, snaggers, molders, patternmakers, boys, woodworkers, press hands and machine operators.

Blacksmiths from all points on the Chicago Northwestern & Illinois Central Railroad systems have signed agreements covering wages and working conditions for one year. A slight increase in wages was granted the men and minor concessions made in the working conditions. The scale of wages signed runs from 30 to 37½ cents an hour. The work day is ten hours, with three hours off Saturday. The agreements affect about 1,000 men on both systems.

The Detroit Steel Products Co., Detroit, closed its plant a few days ago on account of a disagreement about wages between the manager and the employes.

Middletown Tube Works, Middletown, Pa., will advance the wages of its employes April 1 ten percent.

Efforts will be made within a few days to place the mills of the Whitaker-Glessner Co., in Wheeling, W. Va., in operation with non-union men. The Amalgamated Association employes went on a strike several weeks ago on account of alleged scale violations and the conferences that have been held to settle the trouble have failed.

The bi-monthly wage adjustment of the Amalgamated Association with the Republic Iron & Steel Co. has resulted in an advance for the puddlers and finishers for the months of March and April. The average selling price of iron for the

last two months has advanced to 1.40c, and the wages of the puddlers have been advanced to $5.12½ from $4.90 a ton, while the finishers will receive an advance of 2 percent.

A compromise has been effected between the striking employes of the Republic Iron & Steel Co. and the company and the 1,000 men went back to work Thursday. The compromise defeated the efforts of the men to secure a raise of one cent and a half an hour in wages, but secures them the old seven an a half-hour scale.

LAKE SUPERIOR IRON MINES.

The Cleveland-Cliffs Iron Co., Cleveland, has purchased the property of the Jackson Iron Co., Negaunee, Mich., which includes the Jackson mine, historically the most interesting property in the Lake Superior region, as it was at this mine that the first ore was discovered. The discovery was made in 1844, and for many years the mine was one of the largest producers in Michigan, although its total tonnage to date, 3,774,872, seems insignificant as compared with that of mines discovered in later years. The Jackson was operated at first in open pits or cuts, but these, like nearly all of the earlier workings of the Negaunee district, were soon abandoned, and mining was then begun on the underground system. The old Jackson proper was permitted to fill with water in July, 1896, and after that date some attention was given to a leaner ore found immediately east of the old "sand" shaft. This ore contained about 54 percent. iron. In January, 1898, these pits were abandoned. The South Jackson produced a silicious ore, was afterward developed and some ore was shipped, but no work has been done there for several seasons, although as late as 1903 5,409 tons were shipped from stock. The mine was for a long time the main support of the city of Negaunee. It is not settled that new deposits of value may not be found. The ore deposits are very irregular, and it is easy to miss them in diamond drilling. The lands of the Jackson Iron Co. embrace about 200,000 acres located in Marquette, Delta and Alger counties. One tract contains important water falls on the Dead river. The Delta and Alger county lands contain no ores, but have much hardwood that can be used for charcoal in the furnaces of the Cleveland-Cliffs Co.

The old Breen mine, on the Menominee range, which has been inactive for many years, will be a shipper this season. The fee of the Breen is now owned by the Mineral Mining Co. During the winter the property has been thoroughly explored with a diamond drill, with satisfactory results.

The Welch mine of the Commonwealth Iron Co., located a short distance from the Badger, or Commonwealth mine, is now being equipped with a plant of machinery and will enter the shipping lists this season. The shaft has reached a depth of about 300 feet and is now being timbered. It is bottomed in ore. The vein is a narrow one as yet, but it is hoped that it will widen as development work progresses. The ore is an excellent grade, and an output of about 10,000 tons for the season is expected. The plant and machinery now in use at the Welch will be moved to an exploration one and a half miles south of the Commonwealth, known as the Buckeye. It is proposed the sink a shaft at this point. The properties are controlled by Oglebay, Norton & Co., of Cleveland.

Activity of the Cleveland Cliffs Iron Co.

The Cleveland Cliffs Iron Co. is proceeding with its policy of peacefully assimilating the northern peninsula of Michigan, and besides its purchase of the Hall & Munson village, mills and 100,000 acres of land, and the Jackson company's 20,000 acres and other property, is closing other deals. It is adding to its Munising properties a number of dwellings for its employes, is building a large office at Ishpeming for the engineering force, is to explore the Jackson lands thoroughly, and is showing activity in every direction. Its railroad, the Lake Superior & Ishpeming, has ordered 150 112,000-lb. ore cars for the main line and for the Gladstone furnace, and a number of heavy locomotives to go with them, and is improving its docks at Presque Isle. It is working in the Swanzey country, and is exploring very thoroughly large tracts. It is fighting the Breitung suit in the U. S. Supreme court, and it it wins, will have an important addition to its mineral lands in the city of Negaunee. The Jackson deal is very important from the fact that some of its lands lie close to Teal lake, and may be valuable for ore.

At the annual meeting of the stockholders of the Union Iron Works in San Francisco Robert Forsythe was elected president; George Fredericks, vice president; E. M. McIlvain, secretary and assistant treasurer; and Henry Snyder, treasurer and assistant secretary. These are all members of the board of directors. The other elected members of the board are: Charles N. Champion, Hugh Blackmann and A. E. Foster. The directors are all San Francisco men, with the exception of Messrs. McIlvain and Snyder, who are from South Bethlehem, Pa.

The first vessel to sail on Lake Superior in the season of 1905 was the tug Hoffnung Bros., which cleared for points along the north shore from Two Harbors, Minn., on March 4. This is the earliest the boat has ever started out. Last spring it did not start until April 28, or nearly two months later than this spring. On June 18 of last year there was more ice in the lake than there was this year on March 4.

The controversy in regard to the contract for the construction of the library shelves of the New York Public Library, which was awarded to the Snead Iron Co., Louisville, Ky., notwithstanding its bid was about $200,000 in excess of that of the Hecla Iron Works, Brooklyn, has finally been decided in favor of the Louisville company. The report of the engineer of the New York Finance Department stated that the Hecla Iron Works did not comply with the specifications of the contract because it submitted a model of cast iron when the specifications called for a model made of steel.

Gilbert Prentiss, Racine, Wis., has commenced suit against the American Skein & Foundry Co. to compel it to pay him 20,000 shares of stock, which he alleges were to be his payment for forming the merger of the Racine Steel & Iron Co., the Columbus Skein & Iron Works at Columbus, O., the Sandage Steel & Skein Co. of South Bend, Ind. and the W. B. Mitchell Skein & Foundry Co. of Grand Crossing, Ill.

Those who have been fortunate enough to witness the spectacular experiments of Dr. Hans Goldschmidt and E. Stütz, of the Goldschmidt Thermit Co., of New York, will not be surprised to learn that these entertaining and instructive demonstrations in thermo-chemistry have been given to the general public with great success. The *Illustrated London News* and the *Sketch* of recent date give much attention to an exhibition of thermit possibilities, each journal devoting a page to illustrating the presentation at a London theatre.

The board of managers of the Franklin Fund, an accumulation of money left the city of Boston under Benjamin Franklin's will, voted March 9 to inform Andrew Carnegie that the establishment in that city of a Franklin Union, on the general lines of the Cooper Union and the Mechanics and Tradesmen's School, of New York, was deemed advisable. Mr. Carnegie recently offered to give an amount equal to that of the Franklin Fund for the establishment of such an institution. A suitable building and site will, it is estimated, cost $250,000.

The Pilling Air Engine Co., Detroit, recently incorporated, with J. C. Fleming, president; F. L. Bromley, secretary and treasurer, and J. L. Pilling, vice president and general manager, will succeed the Pilling Air Engine Works, which has gone out of existence by expiration of its charter.

REVISED REGULATIONS FOR MARINE BOILERS.

The Iron Trade Review of Jan. 19 had an account of the meeting held in Washington to consider the new rules proposed for boiler material and construction for steam vessels. These regulations had been prescribed by the Board of Supervising Inspectors but were inoperative until approved by the Secretary of Commerce and Labor. Secretary Metcalf held a hearing of those interested in ship construction and navigation with the object of subsequently presenting the criticisms obtained to the Board of Supervising Inspectors, which met in annual session the same week at Washington. The arguments were accordingly submitted and the revised regulations have been approved by the secretary under date of Feb. 25.

It was asserted at the hearing that the rule requiring an iron or steel plate intended for the construction of boilers to be stamped in at least five places was an unnecessary hardship for the manufacturer. Some plates are so small that it would be impracticable to stamp them in the manner prescribed. Col. E. D. Meier, president of the Heine Safety Boiler Co., who represented the American Boiler Manufacturers' Association, was of this opinion and intimated that the rule was probably intended as a guarantee that after the plate had been used in boiler manufacture at least one impression would show plainly. He thought that not more than two stamps would be necessary to ensure this result. The suggestion went unheeded, however, and the latest revision retains the five stamp requirement, calling for the name of the manufacturer, the place of manufacture and the number of pounds tensile stress it will stand to the square inch.

The requirement of a record of the report in duplicate of the tested plate and the transmission of the duplicate to boiler maker, thence to purchaser and local inspector, is made slightly more elastic by allowing the purchaser to hand in either the duplicate report or a certified copy of the one in possession of the boiler manufacturer.

A significant change has been made in one of the regulations relative to inspection. Material approved in one district should in all fairness pass muster in another. Hard and fast rules of universal application are eminently desirable and it should not be possible for the capricious or prejudiced to work at cross purposes to the manufacture. When the material has been inspected at the mills by an assistant inspector, that officer's report and the boiler maker's affidavit "shall" be accepted for the data required. So says the revision, but in the original draft "may" was the word. The stronger word will count heavily for uniformity.

The stipulation made in the first place that every iron and steel plate, "except doubling plates, washers, manhole frames, clip plate braces, crown bars, gusset stays and other similar plate braces," for the construction of boilers shall be tested according to certain prescribed procedure has been broadly amended by striking out the limiting clause here shown in quotation marks.

The argument for a lower tensile strength evidently made an impression, though it was not altogether successful. The rule asserting that "For steel plates the sample must show, when tested, a tensile strength not lower than 50,000 pounds and not more than 75,000 pounds per square inch of section," has now this important addition: "but on boilers whose construction shall be commenced after June 30, 1905, where the plate will come in contact with fire, either in use or in course of construction of the boiler, the tensile strength shall not be more than 70,000 pounds per square inch of section." This is a concession not only favored by practical boiler makers of the stamp of Capt. James Rees, of Pittsburg, and Col. Meier, of New York, but is quite in line with the trend of modern theorists in steel research.

An emphatic objection was made by one speaker at the public hearing to any discrimination being made between the acid and basic processes of steel manufacture. This did not avail, however, and section 8 of rule 1 still demands that "No plate made by the acid process shall contain more than .06 percent of phosphorus and .04 percent of sulphur, and no plate made by the basic process shall contain more than .04 percent of phosphorus and .04 percent of sulphur."

Section 11 of rule 1 reads: "Boilers of foreign built vessels admitted to American registry after June 30, 1905, shall be deemed, if of iron, to have a tensile strength of 45,000 pounds to the sectional square inch; and, if of steel, to have a tensile strength of 50,000 pounds to the square inch," etc. These figures have been reduced 5,000 pounds respectively from the preliminary estimates of Dec., 1904.

At the hearing Mr. Fletcher, of the W. & A. Fletcher Co., of Hoboken, N. J., showed the inadequacy of the government standards for riveting. Single and double riveting receiving attention but triple riveting as frequently employed in the manufacture of the large Scotch boilers now turned out failed of consideration. It is understood that the Board of Supervising Inspectors has had the complete formula governing this under consideration and it is hoped to enact it into law. Probably it will be submitted to the boiler manufacturers of the country for criticism before final steps are taken. The stipulations of the present general rules and regulations make no mention of triple riveting and the requirements of the department thereon, unless by inference it may be supposed to lurk in the paragraph in the appendix which says: "Any riveted joint will be allowed when it is constructed so as to give an equal percentage of strength to that obtained by the use of the formula given." The formula given is for single and double riveting and follows the practice of Thomas W. Traill as presented in his work on "Boilers, Marine and Land, Their Construction and Strength."

H. Coulby, president and general manager of the Pittsburg Steamship Co., and Harvey D. Goulder, of Cleveland, counsel for the Lake Carriers' Association, took an active part in the public hearing and some of their suggestions bore fruit as indicated by the rules now adopted. Among other points already briefly mentioned they opposed the compulsory installation of a donkey boiler on every freight carrying steamer, a ludicrous requirement in view of the almost entirely steel construction of the modern freighter. The donkey boiler for fire fighting purposes was manifestly needless on such a vessel. The latest revision shows the effect of the arguments made and the installation of an auxiliary boiler for fire pumps is now restricted to sea going steamers.

Among the other objectionable items specified by the representatives of the lake interests were the requirements pertaining to bulkheads on all boats carrying passengers, the bulkheads not to be at greater intervals than one-fifth the length of the ship. A lake freighter under these conditions would look like an egg crate and the construction would be a serious impediment to the rapid handling of the cargo. This difficulty would be emphasized in the case of modern ore handling method and equipment. Mr. Coulby made the point that the stringent regulations governing passenger steamers should not apply to the lake freighter which carries no passengers but has provision for caring for a few guests of the owner. This view seemed reasonable enough and it is not surprising that the accepted form now stands with the following sweeping qualification: "Every sea going steamer and every steamer navigating the great Northern and Northwestern lakes carrying passengers for hire shall not have less than three water tight bulkheads," the words "for hire" exempting the freighter, and as will be seen there is in any case a material reduction in the stipulated number of bulkheads.

The Lake Erie Ore Co., Cleveland, has been incorporated with a capital of $100,000, to develop ore lands, by P. H. Lonergan, Frederick L. Lackie, Tracy H. Duncan, E. G. Stranahan and S. W. Hubbard. The company is not yet prepared to announce its plans.

WORLD'S COAL PRODUCTION IN 1903.

Statistics received by the Department of Commerce and Labor at Washington ,through its bureau of Statistics, indicate that the world's output of coal in 1903 was 864,000,000 tons, of which the United States produced 319,000,000 tons, as against 230,000,000 produced by Great Britain, 160,000,000 by Germany, 39,000,000 by Austria-Hungary and 35,000,000 by France. From 1800 to 1850 the world's production was relatively small, and only increased from 11,500,000 tons at the beginning of that century, to 81,000,000 in 1850; the world's commerce meantime increased from $1,500,000,000 to $4,000,000,000. Since 1850 there has been a marked increase. Coal production increased from 81,000,000 tons in 1850 to 864,000,000 tons in 1903; the world's commerce from $4,000,000,000 in 1850 to $22,000,000,000 in 1903.

The rapid growth in the world's production of coal is even surpassed by the record of the United States. In 1800, when anthracite coal was practically unknown in the United States, the world was producing over 11,000,000 tons of coal per annum. In 1870, when the world's coal production amounted to 213,000,000 tons, the United States supplied but 33,000,000 tons, or about 15 percent of the whole, being exceeded by Great Britain, with 110,000,000 tons, and Germany, with over 33,000,000. From 1870 to 1903 the growth in the world's coal production has been from 213,000,000 tons to 864,000,000, a gain of 651,000,000 tons, or over 300 percent. For the United Kingdom the growth has been from 110,000,000 tons in 1870 to 230,000,000 tons in 1903, a gain of 120,000,000 tons, or 110 percent; for Germany, from 33,000,000 tons in 1870, to 160,000,000 in 1903, an increase of 127,000,000 tons, or 385 percent; and the United States, from 33,000,000 tons in 1870 to 319,000,000 in 1903, an increase of 286,000,000 tons, or 867 percent.

The United States, the United Kingdom and Germany supplied four-fifths of the world's coal product, the share contributed by these countries being: United States, 37 percent; United Kingdom, 27 percent, and Germany, 18½ percent. These countries also lead in the production of domestic manufacturers and in like rank in the exportation of domestic products. For 1903 exports of domestic products from the countries named were, Germany, 1.20 billions of dollars; United Kingdom, 1.42 billions; and the United States 1.44 billions.

Of the output of 319,000,000 tons by the United States, practically the entire amount is consumed in the domestic market, as exports have averaged about 5,500,000 tons per annum in the last five years, and have never exceeded more than 3 percent of the total product of a single year. Imports of coal into the United States are also small, and in the last calendar year amounted to but about 1,500,000 tons, as against 3,333,333 in 1903, having averaged about 1,500,000 per annum in the decade from 1894 to 1903. The United Kingdom is the world's greatest exporter of coal, annual exports having ranged between 35,000,000 and 40,000,000 tons, out of a total product of from 200,000,000 to 230,000,000 tons in the last five years.

The Grand Crossing Tack Co., Grand Crossing, Ill., sustained a loss estimated at $400,000 Tuesday, March 14, by the partial destruction by fire of its wire drawing plant at 79th street and Stony Island avenue. The fire started on the second story, where the cardboard boxes, nail kegs, etc., are made and where the printing plant of the company is located. Although the flames spread rapidly, all of the employes, among whom were a large number of women and girls, escaped without injury from the burning building, owing to the excellent fire drill that had been taught them. It is not known how much of the machinery is totally destroyed, but as one section of the building was entirely gutted, the loss in this respect will doubtless be heavy. This is the second severe fire this company has sustained since its organization, the present plant having been built after the first conflagration in April, 1897, which totally destroyed the structure then in existence. The open-hearth plant at Hutchinson, Ill., which supplies the Grand Crossing mill with billets, may be compelled to shut down for an indefinite period.

Obituary.

James White died at his home in Cleveland, March 12, aged 71 years. He had lived in Cleveland 37 years and had devoted much of his time to perfecting patents on safes. He organized the National Safe & Lock Co. of Cleveland in 1884 and was its general superintendent till 1889, when he left it to devote his time to his inventions. He developed several types of gas engines, and also many other ideas, some of which are still in the patent office at Washington awaiting final decision.

A London cablegram of March 12 says that by a gas explosion at the new blast furnace of Bolckow, Vaughan & Co., at Middlesbrough, Eng., H. S. Pollard, an American engineer, who was inspecting the plant was instantly killed.

In the contest for control of the National Hollow Brake Beam Co., David S. Geer, in Chicago, March 13, secured from Judge Tuley an injunction forbidding his fellow directors from ousting him. The writ is directly against Henry D. Laughlin, president of the National company, and Directors Smith E. Allison, Owen N. Fay, John G. Sanborn and H. M. Perry. The meeting of directors was scheduled for March 14.

The Portsmouth Foundry & Machine Co.'s works, Portsmouth, O., have been sold to R. C. Ricker, representing citizens of Birmingham. The Board of Trade of Portsmouth has appointed a committee to confer with the purchasers, to see if a plan cannot be devised for retaining the plant in Portsmouth.

The Cranberry Furnace Co., Johnson City, Tenn., has purchased from the Virginia Iron, Coal & Coke Co. the furnace erected by the Carnegie Iron Co. in 1898, and the rich iron ore mines at Cranberry. The Cranberry Furnace Co. is officered as follows: President, Calvin Pardee; vice president, H. M. Howe; secretary and treasurer, F. P. Howe; manager, L. P. Ross. The company has been the lessee of the furnace, whose annual capacity is 30,000 tons. The product is low phosphorus pig iron.

At the annual meeting of the Lackawanna Steel Co. March 8, the following directors, whose terms expired, were unanimously re-elected to serve for a full term of three years: D. O. Mills, Samuel Mather, Edmund Hayes, E. A. S. Clarke, M. Taylor Payne, George R. Fearing Jr., and Robert B. Van Cortlandt.

The National Mfg. Co.'s plant, at Elkhart, Ind., sold by trustee in bankruptcy, Stafford Maxon, on Jan. 30 to Alfred Marshall and G. C. Stevens, of Chicago, has been sold by them to Robert D. Camp, of Chicago. Mr. Camp has an establishment at 90 Ohio street, Chicago, which manufactures special lines of machinery, and he will use the Elkhart plant to relieve the Chicago establishment from the rush of orders, so that only daylight work will be necessary. He may later move his Chicago plant to Elkhart.

Charles H. Morgan, president of the Morgan Construction Co., Worcester, Mass., has presented to the church at Lancaster, Eng., the birthplace of Henry Cort, and the church at Hampstead, where the famous Englishman was buried, bronze tablets containing a bust of Cort, with an appropriate inscription to the inventor of the art of puddling iron with coal and rolling metals in grooved rolls. Mr. Morgan also presented a large crayon portrait of Mr. Cort to the Worcester Polytechnic Institute.

FOREIGN IRON AND STEEL NOTES.

Robert Sinclair Scott, a well-known engineer, chairman of the Leeds Forge Co., and president of the Engineers' Federation of Great Britain, died on Feb. 28 while about to take a train. Mr. Scott was a member of Scott & Co., the well-known shipbuilding firm, which has been carried on by successive generations of the Scott family for 127 years. He was the third prominent director of the Leeds Forge Co. who has died within the last 18 months.

The *Evening Citizen* of Glasgow, says: "For a week or so back there has been quite an abnormal inrush of semi-manufactured iron and steel material from Germany at Grangemouth. The catalogue includes bars, hoops, strips, plates, scrap, and billets and slabs. Of billets and slabs the quantities are beyond precedent, and have brought about a congestion in the deliveries. This is said to have arisen from buyers in Lanarkshire having placed larger orders than usual on the other side, from a fear that the industrial troubles which prevailed a few weeks ago there would be prolonged. But they have not been, and the contracts have been filled with unlooked-for promptitude. The price for billets and slabs runs from 76s. to 80s. a ton, which is at least 10s. a ton under what local makers could live at. It need scarcely be added that the prices of all the material coming in are much lower than our producers can accept."

A. & J. Main & Co., Ltd., Clydesdale Iron Works, Glasgow, have secured the contract for the steel buildings of the new workshops for the Britannia Royal Naval College, Dartmouth. This is one of the most important contracts that has been placed by the admiralty for some time. The buildings comprise erecting shops, main workshops, boiler shops, smithy, coppersmiths' shop, pattern shop, foundry, engine and boiler house, with engineers' and officers' apartments.

Manning, Wardle & Co., Ltd., have been organized with a capital of £100,000 in £10 shares to carry on the business of locomotive manufacturers at the Boyne Engine Works, Leeds.

The Midland Machine Trust, Ltd., registered with a capital of £100,000 in £1 shares, to carry on the business of manufacturers of and dealers in lace machine parts and accessories, printing machine makers and vendors, mechanical engineers, iron founders, electricians, etc. The registered office is at 26 Deering Street, Nottingham.

The Wolverhampton Corrugating Co. is transferring its works to Ellesmere Park near Chester.

Very extensive improvements are at present being carried out at the shipbuilding yards of Harland & Wolff, at Belfast. These are estimated to cost a quarter of a million sterling. Every machine tool is driven by a separate motor, and all the shops and sheds have been cleared of shafts and belts. Another improvement is the large Brown electric crane which has been erected over two outer slips in the inner yard. The crane is from the firm's own design, and instead of one arm on each side, it has two, one above the other. The upper arms are for use exclusively in hoisting, and the lower arms, although they may also be used in this way, are primarily intended for carrying hydraulic riveters. Among other improvements are the new furnaces that are in course of construction in the frame shed. These are much longer than the old ones, and deeper and wider, in order to cope with the larger pieces now used in ship building.

The Clarence Steel Works, Port Clarence, Middlebrough, Bell Brothers, have this week undergone extensive alterations and improvements.

Thet Wallace Steel Works of Blyde, Ledingham & Co., at Sheffield, have been much improved and extended, largely increasing the output of crucible steel castings.

J. Williams & Sons, of the Globe Foundry at Cardiff, have secured an order for 1,500 tons of castings for one of the London tube railways.

Hadfield's Steel Foundry Co., Ltd., has an order from the British Government for 300 armor piercing shells. These are for the 12-in. steel wire guns which now form the principal armament of the British battleships.

Seven acres of land have been purchased at Bedford by the Sturtevant Engineering Co., Ltd., of 147 Queen Victoria street, London, for a new plant.

The Government of New South Wales has decided to invite tenders in connection with the development of the iron and steel industry of the colony, and will agree to take from manufacturers of iron and steel from native ores all their requirements for a number of years, of rails, girders, building material, etc. A certain minimum per annum may be indicated.

The Steel Co. of Scotland, Ltd., has placed a contract with P. J. Mitchell, of 52 Queen Victoria street, London, E. C., for a complete installation of Rateau patent exhaust accumulator regenerators, together with necessary turbo generating plant, condensers, cooling tower, etc. The plant will regenerate exhaust steam from one blooming mill engine, one finishing mill engine and four large steam hammers, and will eventually, when the second unit is installed, provide the works with 1,300 h. p., without, it is stated, any increase of present fuel costs. The first unit is now on order, together with condensing plant large enough for the complete installation. This will be the first plant on Rateau's system to be erected in Great Britain.

Important Enlargements at Duquesne.

(Special Telegram.)

PITTSBURG, March 15.—It is reported that extensive additions are contemplated at the Duquesne works of the Carnegie Steel Co. The plans include four new blast furnaces, ten 50-ton open-hearth furnaces and a mixer. It is also proposed to increase the capacity of the Bessemer plant at Duquesne.

High Record of the Dunbar Furnace.

(Special Telegram.)

PITTSBURG, March 15.—The furnace of the Dunbar Furnace Co., built for an estimated output of 250 tons daily, produced, during the week ending last Saturday night, 2,011 tons; and one day during the week, produced 322 tons. The furnace operates with by-product coke charged immediately after wet down, coming from ovens, and the consumption of coke per ton of iron is less than 2,000 lb.

Amended Rules for Pig Iron Certificates.

At the urgent request of a large number of important iron houses and consumers, the New York Produce Exchange, during the last month, has been discussing the recently adopted amendments to its rules governing dealing in pig iron certificates, which become effective Monday, March 20.

The substance of these amendments is that pig iron sales for spot or future delivery will hereafter be divided into three groups instead of one, viz.: "Regular," "Foundry" and "Bessemer and Basic."

On "Regular" sales all grades of foundry, forge, Bessemer and basic iron will be delivered as heretofore. On "Foundry" sales, only the different grades of foundry and forge iron will be deliverable. On "Bessemer and basic" sales, only the different grades of Bessemer and basic iron will be deliverable. In other words, there will be three calls on exchange hereafter instead of one. There will be three classes of contracts instead of one, and three kinds of certificates to cover same. Each certificate will describe the class of iron receivable or deliverable on same, and will be further distinguishable by being printed in different colors. The consumer, therefore, who buys certificates for protection, may purchase them in any one of the three groups he desires with the assurance that for every certificate outstanding there will be 100 tons of iron of that group, piled in the yard, and that on cancellation of any certificate he has the privilege of selecting a warrant for any iron of that particular group, for which the trust company may hold a warrant.

NEW ENGLAND FOUNDRYMEN'S ASSOCIATION.

The regular monthly meeting of the New England Foundrymen's Association was held at the Exchange Club, Boston, on March 8, at 4:30 P. M. Vice President W. B. Snow presided. The secretary reported the illness of President John Magee and stated that flowers had been sent him on behalf of the association. Application for membership was received from the Reed Foundry Co., Worcester, Mass., and they were unanimously elected.

Reports were received from the committees on securing new meeting quarters and on the pig iron storage warrant system. These were accepted and filed. The quiz questions arranged by the committee were then discussed as follows:

Ques. What is the best sand to use for making medium brass and bronze castings?

Ans. In the hardware business we find that No. 0 Albany sand for brass castings and No. 1 Albany sand for plain castings is the best that can be used in making up hardware. The Albany sand is strong sand to start with and it is also a stronger sand after being worked.

Ques. Do you use salt in tempering the sand?

Ans. Salt is just as necessary to sand as lime is to sand in order to make it strong. There is no molder that can produce a casting without any salt in the sand. We can produce just as good a casting in green sand in high brass, but we cannot do it without salt. Salt gives the sand strength and without it a molder would be helpless. He could not produce the fine work which we produce today.

Ques. How much salt do you use?

Ans. In proportion we use about ¼ lb. salt to a bucketful of water.

Ans. There seems to be a vast difference of opinion on that point. We use No. 1 Albany sand and we find we can get as good results with No. 1 Albany as with No. 0 sand. If you get in too much French sand, it gets too strong. In regard to French sand, we call it sand, but it is more of a clay than sand and the clay, by ramming up the mold, will make it quite air tight. The question of today is how will the foundryman go to work to make all his gas escape. If he can do that then he is sure of a good sound casting.

Ques. What has been your experience in the use of old or burnt core sand in mixture?

Ans. We use old core sand because it is absolutely necessary in making up good castings. The old core sand is more porous and allows the gas to escape more readily than new core sand.

Ans. We have started recently to use old core sand on certain mixtures. We are today using about 20 percent on medium sized cores and about 30 percent on larger cores. We use a dry compound and that is the only thing that will hold core and sand successfully. We can handle more old sand with the dry compound.

Ques. What success have you had with core compounds or core oils?

Ans. The smallest core we make is about ⅛ in. diameter and I find that the core compound is the best binder. It is far better for the cores than core oil.

Ans. Going back to the old methods of core making, you can make a core of glue, or a core of flour, or a core of core oil, or any other compound which it in the market today, but the main point is this. Sometimes the foundryman condemns a good article, he never goes far enough to investigate what the reason is that his cores blow. In all probability he does not vent the core properly. If the core is 3½ in. long it should be vented 2½ in. and the coremaker has vented it only 1 in. When the molder puts that core in the casting there is a blow there. The main point in making a core is the venting of the same.

We have tried core oils and compounds but are now using burnt sand with glue. We found with core compounds and core oils it took us so long to get the core out of the top of a small hole that we had to go back to the old method of core making.

After a short intermission the meeting adjourned to dinner. At the evening session the president introduced as the speaker Mr. Geo. H. Hull, of New York, president of American Pig Iron Storage Warrant Co., whose remarks were on the use of the warrant and certificate system by foundrymen in supplying themselves with pig iron. He said that the warrants were simply a receipt for 100 tons of pig iron. They designate on the face the brand, grade and weight, and upon the return of the warrant the 100 tons as described on the face of the same would be put on the cars free of charge. Iron bought on these warrants are purchased on both anaylsis and fracture grading. At the conclusion of the speaker's remarks there was some discussion, after which a unanimous vote of thanks was extended to Mr. Hull. The meeting adjourned at 9:50. The following were in attendance:

Geo. H. Hull, American Pig Iron Storage Warrant Co.
Walter B. Snow, B. F. Sturtevant Co.
Harry Gibby, Mechanics Foundry Co.
J. O. Henshaw, N. S. Bartlett & Co.
H. A. Carpenter, A. Carpenter & Sons Fdy. Co.
M. H. Barker, American Tool & Machine Co.
Edwin E. Bartlett, E. E. Bartlett.
F. F. Stockwell, Barbour-Stockwell Co.
C. A. G. Winther, Chapman Valve Mfg. Co.
Geo. H. Lincoln, G. H. Lincoln & Co.
S. G. H. Fitch, Vaughn Machine Co.
H. F. Arnold and C. Hitch Jr., American Tool & Machine Co.
L. N. Perrault, B. F. Sturtevant Co.
G. H. Carson and A. W. Gibby, Mechanics Foundry Co.
Geo. O. Sawyer, Hartford Laboratory Co.
Chas. Mills, Saco & Pettee Machine Shops.
A. L. Lovejoy, Becker-Brainard Milling Machine Co.
Chas. J. Caley and Joseph Schilling, Russell & Erwin Mfg. Co.
W. H. DeWolfe and W. T. Hartman, P. & F. Corbin.
Wm. H. Stafford, E. S. Decker and Geo. H. Gibby, Gibby Foundry Co.
W. A. Garratt, Whiting Fdy. Equipment Co.
W. P. Smith, Iron & Hardware Mercantile Co.
C. A. Reed, N. S. Bartlett & Co.
S. E. French, Athol Machine Co.
R. H. Penney, S. M. Thompson and T. C. Wilson, Barbour-Stockwell Co.
E. J. Lyon, Brown & Sharpe Mfg. Co.
F. W. Dixon, Taunton Locomotive Works.
F. G. Scholfield, Whitcomb Fdy. Co.
F. J. Stewart, Jas. Stewart & Co.
A. B. Herrick, Smith & Wallace.
E. A. Tutein, Crocker Bros.
A. L. Nash, Dalton, Nash & Co.
W. M. Saunders, Saunders & Franklin, Chemists.
F. A. Fisher, Enterprise Fdy. Co.
B. M. Shaw, Walker-Pratt Mfg. Co.
R. Hazeltine, Magee Furnace Co.
Wm. J. Breen, Hugh W. Adams.

An offer of $1,180, together with the regular semi-annual dividend of $20 per share, payable May 15, has been made to all stockholders of the Lowell Machine Shop, Lowell, Mass., for their shares. The offer is made by Robert F. Herrick, who withholds the names of his clients.

Fred Holz, president of the Cincinnati Milling Machine Co., Cincinnati, has sold part of his stock holdings in that company to Fred A. Geier, and retires from the presidency. Mr. Geier succeeds him as president. The other officers are G. A. Mayer, treasurer, and C. Wood Walter, secretary. A reorganization of the financial affairs of the company will be made later. Mr. Holz has gone to Florida for a rest.

The annual meeting of the Montreal Steel Works, Ltd., Montreal, Canada, was held a few days ago. The net earnings for the year 1904, after providing for all contingencies, were $116,090. A dividend of 7 percent per annum on preferred stock was paid. A dividend of 5 percent on the common stock for 1904 has been declared.

IRON ORE MOVEMENT IN THE UNITED STATES.*

BY JOHN BIRKINBINE.

Thirty-five million long tons of iron ore, the product of the mines of the United States, must be handled and transported in a year from the mines where it is won, to the furnaces where it is consumed. The advances made in iron manufacture have been largely brought about by methods of transportation or of handling large quantities of bulky materials, for the earlier industries depended almost entirely upon local supplies of the mineral and the fuel. The development of canals and subsequently of railroads changed the conditions, but the bulk of the iron ore of the United States which is fed to the blast furnaces came from near-by deposits, until the Lake Superior iron ore producing region became a prominent factor in supplying the material.

The appliances for cheaply handling ores from the mines to cars and from cars through docks to vessels, again from vessels to stock piles or to cars, have been developed to a greater extent in connection with the Lake Superior iron ore region than elsewhere. And today a number of deposits of iron ore are lying dormant close to active blast furnaces because cheap transportation delivers iron ore of superior quality to the furnaces at lower cost than it is believed the local ores could be won and used.

It is possible that in some cases this expectation is not based upon a true appreciation of conditions. The average yield of the Lake Superior ores, as far as iron is concerned, is greater than at many of the other mines; the phosphorus contents of many of the Lake Superor ores is also very low, and few have sulphur in quantity to be troublesome. The opportunity for obtaining this ore in large quantities delivered as required, with contents guaranteed, facilitates the work of the blast furnace manager and relieves him from uncertainties in connection with local deposits, where the same course is not pursued, while the average iron ore contents makes it possible to secure more economical fuel consumption and better operation in the blast furnace plant than with leaner ores or those which are, by reason of mining conditions, less uniform in their physical characteristics. It is, however, probable that at some of the mines which are now inactive ore could be advantageously won and used as partial supplies to near-by furnaces at a saving in actual outlay per ton of product.

Although the consumption of iron ore per ton of pig is greater than the consumption of fuel, it has been found advantageous to locate blast furnaces close to the fuel supply in preference to placing them convenient to the iron ore supplies. This is easily explained, because the amount of coal mined to produce coke sufficient for smelting a ton of pig iron approximates closely to actual weight the amount of ore necessarily entering into the ton of metal. But more important still, the existence of large bodies of coal encourages the location of industries and communities, which are dependent upon cheap fuel for their success, and the abundance of coal also facilitates the railroad competition, therefore the bulk of pig iron produced in the United States is at considerable distances from the iron ore supplies, in fact, the production of iron ore in the States which contribute the largest amount of pig iron, is practically insignificant, except in Alabama, Virginia and Tennessee.

The manufacture of iron is greatest in Pennsylvania, followed in order by Ohio, Illinois, Alabama, New York, Virginia, etc. But the amount of iron ore mined in Pennsylvania would not produce 5 percent of the pig iron made in that State, while a less amount represents the relation which the iron ore mined in Ohio bears to its pig iron output; and in Illinois there is no ore mined. In Alabama, owing to the fact that the red hematite occurs close to desirable deposits of coking coal and limestone, the conditions are changed, and little or no material is introduced from a distance. This also holds good for Tennessee, although that State is relatively a small producer, and in Virginia local ore supplies have been lately supplemented by ore from Lake Superior.

In the following table appears the amount of pig iron produced and the quantity of iron ore mined in the various States during the year 1903, and an investigation of this table will demonstrate for each particular State the conditions as above outlined. The figures of production of pig iron are taken from the report of the American Iron and Steel Association, and of iron ore from the monograph of the United States Geological Survey:

PRODUCTION IN 1903. LONG TONS.

State.	Pig Iron.	Iron Ore.
Pennsylvania	8,211,500	644,599
Ohio	3,287,434	29,688
Illinois	1,692,375	none
Alabama	1,561,398	3,684,960
New York	552,917	540,460
Virginia	544,034	801,161*
Tennessee	418,368	852,704
Maryland	324,570	9,920
Wisconsin and Minnesota	283,516	16,046,449
Michigan	244,709	10,600,330
Rocky Mountain States	200,000 (approx)	645,151†
Other States	688,431	1,163,886
Totals	18,009,252	35,019,308

* Includes a small amount from West Virginia.
† A considerable amount of the iron ore mined in the Rocky Mountain Region is used in the silver smelters.

As the Lake Superior region produces over three-fourths of all the iron ore mined in the United States, and the States of Michigan, Wisconsin and Minnesota, in which this iron ore is mined, contribute but relatively small amounts of pig iron, it is evident that the bulk of the mineral mined finds use elsewhere. And, therefore, the transportation of the ores from the various ranges which compose the Lake Superior region and the distribution of these ores is an interesting subject.

The writer prepared a graphic representation of the movements of iron ore for 1902 for the U. S. Geological Survey. From the Lake Superior region there is a local consumption of limited amounts of iron ore at blast furnaces located on or near the shores of the Great Lakes; a semi-local demand from furnaces in the eastern peninsula of Michigan; and some ore finds a market by all-rail routes to blast furnaces in Wisconsin, and at times to Chicago and St. Louis. In the year 1902 the total all-rail shipments from Lake Superior mines amounted to 531,952 long tons, but most of the ore mined goes to Lake Erie, although the Lake Michigan ports are important factors, particularly in supplying the blast furnaces at Chicago and in the neighborhood thereof and at Milwaukee. Shipments of iron ore eastward from the Lake Superior region through the Sault Ste. Marie canal in 1902 approximated 21,800,000 long tons; in 1903, 19,000,000 long tons, and in 1904, 17,500,000 long tons.

The furnaces close to the Atlantic seaboard obtain portions of their supplies from foreign countries, and this importation was greater during 1902 and 1903 than in any previous year with but one exception, reaching one million tons per annum.

In the central portion of the country the manufacture of iron is rapidly reaching important proportions, and in Colorado the output of pig iron exceeded 200,000 tons, but the Colorado furnaces, while obtaining a portion of the ore from that State, supplement that largely by drafts upon Wyoming and New Mexico, some of the ore being hauled from 300 to 650 miles.

The mineral taken from the Lake Superior mines as a rule covers greater distance than other ores, and it is probable that the average travel of Lake Superior ores approximates 900 miles. In this distance it is transferred from the mine cars to standard railway drop-bottom cars (often with the

* Extract from a paper read before Section D, Mechanical Science and Engineering, at the Philadelphia meeting of the American Association for the Advancement of Science.

intermediate skip), from railway cars into the bins of ore shipping docks and from these into the holds of vessels. Lifted from these vessels the ore is loaded on other standard railway cars for transportation to the furnace or on stock piles from which the cars are later loaded.

With all this handling a large proportion of Lake Superior iron ore is not touched by the hand of man from the time it leaves its bed in Mother Earth until it is discharged into the throat of the blast furnace. Steam shovels, automatic chutes at docks, drop-bottom cars, mechanical handlers and bridge tramways, bins and skips, take the place of natural labor and permit handling and transporting large quantities of ore at marvelously low rates.

Wages in the Connellsville Region.

The advance in wages of the coke workers and miners employed by the H. C. Frick Coke Co. in the Connellsville region, has been followed by similar advances made by nearly all the independent operators in the region. The wages that have maintained since 1894, together with advances and declines have been as shown in the accompanying table.

	Feb. 10, 1894.	Apr. 1, 1895.	Oct. 1, 1895.	Jan. 1, 1896.	Apr. 29, 1899.	Feb. 28, 1900.	Jan. 1, 1902.	Dec. 16 1902.	Mar. 1 1905.
Mining and loading room and rib coal	$ .78	$ .90	$ .95.4	$1.05	$1.12½	$1.25	$1.35	$1.10	$1.20
Mining and loading heading coal	.88	1.02	1.08	1.20	1.27½	1.40	1.50	1.25	1.37
Mining and loading wet heading coal	.95	1.10	1.16.6	1.25	1.32½	1.45	1.55	1.30	1.45
Drawing coke per 100 bushels charged	.43	.50	.53	.60	.64	.72	.77	.63	.70
Leveling	.08	.09	.09.5	.10.4	.10½	.12	.12¾	.10½	.11½
Drivers and rope riders (shafts and slopes)	1.65	1.84	1.95	2.05	2.12½	2.35	2.50	2.20	2.40
Drivers and rope riders (drifts) per full run	1.60	1.75	1.85.5	1.95	2.02½	2.25	2.40	2.10	2.30
Cages, per full run	1.65	1.84	1.95	2.05	2.12½	2.35	2.50	2.20	2.40
Tracklayers, blasters and timbermen (shafts, slopes)	1.65	1.84	1.95	2.05	2.12½	2.35	2.50	2.20	2.40
Tracklayers, blasters and timbermen (drifts, per day)	1.60	1.75	1.85.5	1.95	2.02½	2.25	2.40	2.10	2.30
Assistant tracklayers and inside laborers	1.35	1.50	1.59	1.65	1.72½	1.87½	1.97½	1.65	1.75
Dumpers and tipplemen	1.35	1.50	1.59	1.68	1.75½	1.90½	2.00½	1.68	1.80
Teamsters, per day	1.35	1.40	1.48.4	1.55	1.65	1.80	1.90	1.60	1.70
Carters, per day	1.20	1.25	1.32.5	1.40	1.50	1.60	1.70	1.50	1.60
Yard laborers	1.10	1.20	1.27.5	1.35	1.45	1.55	1.65	1.40	1.75¼
Chargers, per oven	.03	.03½	.03.7	.04	.04¼	.04¾	.05	.04	.04
Chargers, per day	1.40	1.50	1.59	1.68	1.75½	1.90½	2.00½	1.75	1.85
Trapper boys	.50	.58	61.5	.68	.78	1.00	1.10		
Forking cars, 40,000 lbs. capacity	.85	1.10	1.16.6	1.25	1.35	1.50	1.65	1.40	1.50
Forking cars, over 40,000 lbs. capacity	.95	1.25	1.32.5	1.40	1.50	1.65	1.80	1.50	1.60
Forking cars, less than 40,000 lbs. capacity	.75	1.00	1.06	1.25	1.35	1.50	1.65	1.60	
Forking cars, over 60,000 pounds									1.75

Canadian Industries.

TORONTO, Canada, March 14.—The Dominion Geological Survey has just published a summary of the mineral production of Canada for 1904. The value of the total metallic production is given as $31,222,525, and the non-metallic as $28,820,640. The estimated value of mineral products not returned is $300,000, making a total for the year of $60,343,165. This shows a decrease as compared with the last few years. The mineral production reached high water mark in 1901, when it was valued at $66,339,158. It stood at $63,885,999 in 1902 and $62,600,434 in 1903. The decrease as compared with 1903 is almost entirely in the metallic class, the largest item being that of gold, which was produced in the Yukon to the value of $10,337,000—a decrease of $1,913,000, the gold output of other provinces being $6,063,000, or a decrease of $530,590. Exports of iron ore were 168,828 tons, valued at $401,738, an increase in value of $16,811. In addition to the ore exported 180,932 tons, value $489,687, were mined for the production of pig iron in Canadian blast furnaces. Of the total production of pig iron in Canada in 1904 from both Canadian and imported ores, it is estimated that 68,297 tons valued at $901,880 should be attributed to Canadian ore—an increase in value of $194,042. The pig iron was made by three establishments in Nova Scotia, two in Quebec and four in Ontario.

The Imperial Steel & Wire Co., of Collingwood, Ont., will run day and night this week, as the company has orders on hand sufficient to keep it busy until June. It has a keg plant now in operation to supply kegs for its wire nail output. It will make a specialty of cement-coated wire nails for box purposes. The output of the nail mill is 25 tons per day.

The Winnipeg plant of the Munro Wire Works, Limited, will be in operation early in April. Mr. Munro, who comes from New Glasgow, N. S., is the inventor and patentee of several of the machines which are being installed. The class of goods to be turned out will include wire, iron and steel fencing, spiral railway fencing, grill work and all of the heavier class of wire work. Five experts are to be brought from the East.

Among the companies incorporated under the laws of Ontario are the following:

The Canadian Northern Coal and Ore Dock Co., Ltd., for the construction of docks, wharves, etc., at Port Arthur, with head office at Toronto; capital $500,000; provisional directors Jas. S. Lovell, Wm. Bain, Robert Gowans, Ernest W. McNeill, Richard Richardson, Francis C. Annesley and Robert P. Ormsby.

The Boilean Reduction Co., Ltd., to carry on business as a milling, mining, reduction and smelting company; head office Toronto; capital $1,200,000. Provisional directors, Frederick Plumb, Frederick V. Philpott, James T. Ross, Thomas S. Collis and Frederick W. Baldwin.

The Canadian Drawn Steel Co., Ltd., to manufacture steel; head office Hamilton; capital $100,000. Provisional directors, Wm. A. McCool, Henry John Waddie, and D'Arcy R. C. Martin.

Clark-Demill Co., Ltd., to manufacture machinery; head office, Hespeler; capital $100,000. Provisional directors, Geo. D. Forbes, John R. Phin and Anthony Octis.

Fountain Condenser Co., Ltd., to manufacture steam condensers, etc.; head office Penolea; capital $40,000. Provisional directors, John C. Fountain, John Schram, David S. Robb, John C. Winters and Isaac Greenizen.

At the recent annual meeting of the American Hardware Corporation, New Britain, Conn., it was decided to increase the capital stock from $5,000,000 to $7,500,000, a part of the new capital to be used in purchasing the Corbin Cabinet Lock Co., New Britain, which has a capital stock of $200,000. The stockholders chose the following directors: Philip Corbin, Andrew Corbin, Charles M. Jarvis, A. J. Sloper, Charles H. Parsons, Charles Glover, Howard S. Hart, S. C. Dunham, of Hartford; Frederick P. Wilcox, John H. Whittemore, of Naugatuck, Charles Miller, of Waterbury and George W. Corbin. The last two named directors were added to the board to represent the Corbin Cabinet Lock interests, and the board otherwise remains the same as last year. The corporation has recently increased its dividend from 2½ percent yearly to 1 percent. The directors' annual report of the American Hardware Corporation gave the total assets of the subsidiary companies as $7,992,201; the bills and accounts payable amounting to $868,532, leaving the net assets $7,123,668. The net earnings during the year were $548,240, about the same as in 1903.

The final proceedings in bankruptcy court in the case of the Ohio Steel & Iron Specialty Co., Cuyahoga Falls, O., have been held. The company paid a final dividend of 2.3 percent, making the total dividend to creditors 6.3 percent.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The Davison-Namack Foundry Co., Ballston Spa, N. Y., has been incorporated with a capital of $8,000. The directors are: H. B. Davison, W. H. Namack and J. D. Namack, of Ballston Spa.

The Henry & Wright Mfg. Co., Hartford, Conn., has been incorporated to make and deal in machinery. The authorized capital is $80,000, and business will begin with $50,000. Robert G. Henry and Daniel M. Wright, of Hartford, and Joseph H. King, of West Hartford, are the incorporators.

The Ohio Falls Tool Works, Louisville, Ky., has been incorporated with a capital stock of $20,000, divided into shares of $100 each. The incorporators, who hold 25 shares each, are: Charles Bergen, Charles Ferst, Joseph L. Haag and B. T. Gividen. The maximum indebtedness is $10,000.

The Bridgeport Wire Goods Co., Bridgeport, Conn., has filed a certificate of incorporation. The authorized capital is $50,000, and business will begin with $2,500.

The Sunderland Mfg. Co., New York City, has been incorporated with a capital of $25,000. The incorporators are: S. C. Burdick, C. I. Abbott and others.

The Poler Mfg. Co., Baltimore, Md., has been incorporated to manufacture circular and folding machines. Capital stock, $10,000. The incorporators are: John W. Poler, Alexander Anderson, John J. Rein Jr., Donald McKay and William T. Larkin.

The Ohio Nut & Bolt Co., Berea, O., capital $99,996, has been incorporated by John S. Stadler, O. R. Stone, Thomas Reid, W. M. Davis, J. O. Huffman, A. A. Boller, H. E. Boller and E. N. Renblin.

The Dennison Foundry Co., Dennison, O., has been incorporated with a capital of $60,000. The incorporators are: M. Dunn, J. F. Digan, P. F. Smith Jr., E. D. Moody and W. A. Coldren.

The Thos. Cox & Sons Machinery Co., Little Rock, Ark., has been incorporated with a capital stock of $25,000, of which $20,000 has been subscribed. The officers are incorporators are: Thos. Cox, president and treasurer; A. B. Cox, vice president; G. P. Ehlers, secretary.

The Union Foundry Co., of Seattle, Wash., has been incorporated with a capital stock of $18,000. The incorporators are: Axel Sjostrom, Nels Kartvig and Adolph Swensen.

The Cummings Machine Works have been organized at Boston, Mass., to operate a foundry and machine shop. Henry H. Cummings is president and treasurer, and the capital stock is $25,000.

The Great Western Heater Co., of Des Moines, Ia., has been organized by R. J. Shank. The company will have its headquarters in Des Moines and will manufacture heaters.

A foundry with a capital of $5,000 has been started at Demopolis, Ala., with the following officers: A R. Smith, president; W. M. Spencer, vice president; L. W. Spaulding, secretary and treasurer.

The Wayne Stove Co., of Fort Wayne, Ind., has been organized with a capital of $50,000. The incorporators are: Wm. H. F. Moellering, Saml. M. Holtzman, Geo. B. Aldrich, Albert K. Hart and H. W. Dickman.

The Black-Clawson Co., Hamilton, O., will remodel its machine shop. The company will install electric drives for all the shop equipment and will then be in the market for lathes, boring mills and special machinery adapted to the manufacture of paper mill machinery.

John E. Angell & Co., East St. Louis, Ill., have been incorporated with a capital of $25,000, to conduct a general foundry and machine manufacturing business. The incorporators are: John E. Angell, James G. McHale and W. T. Summer.

C. O. Snyder, 135 West Ninety-sixth street, New York, is about to start a new machine shop and desires catalogues of equipment. He is in the market at present for a number of lathes, punches, presses, shears, milling machines, etc.

The Coin-Handling Machine Co., New Brunswick, N. J., has been incorporated with a capital stock of $100,000. The company starts business with $1,500 subscribed, and has established an office at the corner of Spring alley and Albany street. The incorporators are: August C. Streitwolf Jr., 262 Handy street; Robert D. Geswein and Wm. Scully, 59 Wall street. The company is authorized to do a general manufacturing business. Joseph E. Nehav is the agent in charge of the concern.

Fires and Accidents:—

The machine shop of Joseph Deforge, 51 Parkland avenue, Lynn, Mass., was burned, with contents, March 4. Damage, $2,500, covered by insurance.

A two-story frame building belonging to the Iron Clad Mfg. Co., Brooklyn, N. Y., was burned Feb. 28. The building was the original factory of the company, but had lately been used as a storeroom. The fire, which started in the furnace, finally caught several barrels of oil, causing an explosion. Five hundred men are thrown out of work, and the loss on stock and machinery is estimated at $75,000.

The foundry of the Barcus Co. and the Wabash Stove Co., Wabash, Ind., was partially destroyed by fire March 5. The main part of the plant was saved, but patterns were destroyed which will be hard to replace. Loss, $8,000.

The annealing building of the Missouri Malleable Iron Co., East St. Louis, Ill., was damaged by fire March 7. A large amount of valuable machinery was destroyed, the loss amounting to $100,000.

The foundry of I. Droege & Sons, of Covington, Ky., was visited by a serious fire on March 6. The molding department was entirely destroyed, together with some new tools and a large amount of stock. The loss is estimated at $35,000, which is fully covered by insurance. The engine room, pattern and pattern storage departments and some other departments were saved.

The foundry plant of the Bovee Furnace & Grinder Works, of Waterloo, Ia., was destroyed by fire on March 3, with a loss amounting to $15,000, which was partially covered by insurance. The work of the foundry will be done in other foundries in the city until the company can rebuild the burned structure.

New Construction:—

A building permit has been granted to the Central Iron Works, of Syracuse, N. Y., for the construction of several buildings, including a foundry, to replace those recently destroyed by fire.

The J. B. Morris Foundry Co. will erect a large concrete addition to its foundry at Cincinnati, O.

A foundry is being added to the Burns Boiler & Machine Co.'s plant at Jonesboro, Ark. This will enable the company to do work which it has formerly had to have done at Memphis, Tenn.

Work at the Kerbaugh plant, near Bellwood, Pa., is progressing rapidly. Several of the buildings are practically completed and it is expected that the plant will be in operation May 1. The machine shop will be 120 by 230 feet and the foundry 50 by 50 feet.

The Olbrich & Clay Foundry at Cedar Falls, Ia., which was recently destroyed by fire, will be rebuilt.

The Coldwell Lawn Mower Co., Newburg, N. Y., has taken over the business of the Lackawanna Valveless Motor Co.,

of Buffalo, and intends to manufacture the motors as was done by the Buffalo concern. The company will put up a building in the fall to accommodate the plant, which will then be removed to Newburg.

McCarthy & Malinski, of Cairo, Ill., have commenced the erection of their new foundry and machine shops at Cairo, Ill.

The York Mfg. Co., of York, Pa., will erect a large pattern storehouse 100 by 115 ft. It will be two stories in height, constructed of brick with stone trimmings. This company is also planning to make a number of other additions and improvements to its plant during the coming season.

The Standard Sanitary Mfg. Co. has awarded a contract for the construction of the additions to its plant at Louisville, Ky., including a foundry and warehouse. The additions will cost about $50,000. The foundry will be 150 by 280 ft., and there will be several other large buildings.

The Carroll Foundry & Machine Co., of Bucyrus, O., will erect a new steel foundry building 130 by 300 ft. during the coming summer.

The Keith Furnace Co., of Des Moines, Ia., has just completed the erection of a new office building and pattern shop. The building formerly operated by the offices and pattern shop will be given over to the foundry as an assembling and mounting room.

Geo. Clare, president of the Clare Mfg. Co., of Preston, Canada, recently visiting Winnipeg, Manitoba, and made arrangements for the erection of a foundry plant by his company.

J. H. Newbury, of Middletown, N. Y., is planning to erect an addition to his foundry at Goshen, N. Y. The addition will be 40 by 100 ft. and will be occupied for offices, while the present offices will be fitted up for a machine shop.

J. P. Raymond, of Oswego, N. Y., is planning to build a new foundry at Red Creek, N. Y.

The Frazer & Jones Co., Syracuse, N. Y., will enlarge its plant by erecting new buildings to be used as foundry and pattern shop. It has also elected the following officers for the coming year: President, R. W. Jones; vice president, Fred Frazer; treasurer, Chas. R. Jones; secretary, O. P. Letchworth.

The Davis-Forrest Machine Works, of Savannah, Ga., expect to erect an iron and brass foundry.

The Wellsburg Heating, Ventilating & Foundry Co., of Wellsburg, W. Va., expects to make extensive additions to its foundry.

Plans are being perfected by Stanley G. Flagg & Co., Pottstown, Pa., for the erection of a building on the site of the foundry recently destroyed by fire. The new building will probably be larger than the old structure.

Westwater & Casey, Columbus, O., who bid $61,013, have been awarded the contract for the pumping station of the sewage disposal plant of that city.

A new plant for the Joy Stove Works, Chicago, Ill., is to be built at Eighteenth place and Western avenue. It will be three stories high, 75 x 150 ft., of brick and stone, and will cost $25,000.

The contract for the erection of the Texas Midland shops at Terrell, Texas, has been awarded D. C. McCord, of Dallas. Three substantial buildings are to be erected for machine, car and paint shops.

The engine house at the city tunnel plant, Santa Barbara, Cal., destroyed by fire, Feb. 10, has been rebuilt. In place of the frame engine house and other buildings, structures made of corrugated iron have been erected. New machinery is being installed and will be in operation by April 1. The reconstruction is under the direction of Smith & Hunt, contractors.

The James Leffel & Co., Springfield, O., is erecting a new steel building for a boiler shop, which will be 56 ft. wide by 225 ft. long. The company has purchased a complete line of Hilles & Jones boiler making tools, motor-driven; also electric traveling cranes, motor driven, of the Northern Engineering Co., Detroit. The foundations are in, and the steel work will soon be erected. The plant will be in operation by the first of May. The building is of the very latest design and up-to-date in every particular. The company manufactures turbine water wheels, steam engines and boilers.

The Fort Wayne Plow Point Co. has purchased a site and will build a plant in the thriving industrial district known as "Nebraska" in the western part of Fort Wayne, Ind. The main structure is to be 60 x 200 ft., with two wings, one 40 x 100 ft., the second 54 x 24 ft. The buildings will be of brick.

The Soo road will build a $40,000 addition to its machine shops at Minneapolis. The addition will be two-story, of brick and stone, 123 x 138 ft.

The Union Drawn Steel Co., Beaver Falls, Pa., will establish a branch at Hamilton, Ontario. The company has obtained a site, and the first building to be erected will be 300 x 60 ft. The Canadian company will manufacture a full line of polished steel shafting, shapes, finished forgings, castings, etc.

The Missouri Malleable Iron Works, East St. Louis, Ill., will rebuild the annealing building which was destroyed by fire March 7. The new structure will be 110 ft. wide by 450 ft. long, and will cost about $45,000.

A permit has been issued to the Gibson-White Co., Chattanooga, Tenn., for the erection of a foundry at a cost of $1,000.

The Lowell Machine Shops, Lowell, Mass., will manufacture and erect the necessary machinery for doubling the plant of the Georgia Mfg. Co., Whitehall, Ga. The erection of a new building to accommodate this equipment has been begun.

The plans for the steel plant of the Halcomb Steel Co., near the State Fair grounds at Syracuse, N. Y., are rapidly nearing completion. It is proposed to break ground early in the spring.

The Buckeye Fence Machine Co., Ashtabula, O., has purchased a tract of land, and the construction of a plant will be begun as soon as the weather will permit.

The O. S. Kelly Western Mfg. Co., Iowa City, Ia., will erect a new foundry.

At the plant of the Baldt Steel Casting Co., New Castle, Del., fires were lighted in the boiler room for the first time March 3. The work of placing the machinery in position is being done as rapidly as possible.

The Robb Engineering Co., Amherst, N. S., has recently completed a new machine shop, 250 x 100 ft.

The contract for rebuilding the Rome Merchant Iron Mill, Rome, N. Y., has been let to the American Bridge Co. The plant will be of steel and fireproof in every particular. It is expected that the plant will be in operation by June 15.

Wyman & Gordon, Worcester, Mass., manufacturers of drop forgings, will build an addition 40x80 ft. to the forge shop, a one-story building 30x100 ft., for heating and annealing furnaces, and a brick storage building.

The New Home Sewing Machine Co., Orange, Mass., will build an addition 56x221 ft., five stories. Another building will be erected at a later date.

The New Departure Mfg. Co., Bristol, Conn., will erect an addition 50x100 ft., four stories, for the manufacture of bicycle and automobile parts, as well as two other lines which are not ready for announcement.

The Aurora Foundry Co., Aurora, Ill., will erect a pattern shop, 30x60 ft., and a new office building, and will build an addition to the foundry which will make that building 70x200 ft.

Abendroth Bros., New York, will build a new molding shop, 90x175 ft., at the plant in Newburgh, N. Y. They will also erect a machine shop, 50x140 ft., six stories.

The Charles Ervien Co., manufacturer of tanks, stacks and boilers, in Philadelphia, will erect a new one-story shop, 120x

136 ft., of structural steel and corrugated iron. Machinery and tools for the new plant have been contracted for.

General Industrial Notes:—

By special act of the county commissioners, the new pipe plant of the Coosa Pipe & Foundry Co., at Gadsden, Ala., has been made exempt from taxation for a period of five years. The city has already exempted the company from city taxation. The new plant will employ 500 men when it is completed.

The machinery for the new plant of the Grant's Pass Iron & Steel Works, of Grant's Pass, Ore., is being installed and Grant's Pass will soon have the largest foundry in the State south of Portland.

The Wilcox Engineering Co., Saginaw, Mich., recently incorporated, has taken over the business of the Michigan Salt Machinery Co. and also its equipment. The new company will manufacture automatic rakers for removing the salt from the salt grainer as fast as it is formed; also conveyors, elevators, salt carts and other appliances used in the manufacture of salt. The special branch of the business is the erection of salt plants and improving of existing buildings. The bulk of the material entering into the machines and constructions is steel rolled shapes, concrete and timber.

The Jefferson, Ind., branch of the American Car & Foundry Co., which has been closed all winter, will resume in a few days and will employ 1,000 men.

The Herron Pump & Foundry Co., Knoxville, Tenn., has applied for an amendment to increase its capital stock from $100,000 to $150,000, in order to meet the demand of its growing business. The concern has secured a contract for furnishing large supplies of valves and hydrants to the Panama Canal commission.

About 100 of the employes of the Janesville Machine Co., Janesville, Wis., have commenced working time and a quarter on account of the large number of orders on hand.

The Emporia Corrugated Metal Mfg. Co., Emporia, Kan., began operations March 1 with encouraging prospects. The officers of the company are: J. E. Pyle, manager and treasurer; W. S. Williamson, president; U. S. Wolfe, secretary. The directors are: W. S. Williamson, J. E. Pyle, U. S. Wolfe, W. C. Lee, D. C. Allen.

Charles Walker, formerly of Youngstown, O., has organized the Walker Motor Foundry & Machine Co., of Detroit, Mich.

The Wetherbee Machine Works, of Meridian, Miss., and W. T. Adams, of Corinth, Miss., have consolidated their interests and will manufacture the products of the Wetherbee Machine Works and the New Era Heating & Ventilating Co. The new company will be organized with a capital of $100,000. Its plant will be located at Meridian.

The leading enterprises of Springfield, O., are now very busy. Both of the large plants of the American Seeding Machine Co. are running with exceptionally large forces; each division is being operated 13 hours per day. The Champion division of the International Harvester Co. is running with a full force of men. P. P. Mast & Co. are shipping about five carloads per day. All departments of the Fairbanks Machine Tool Co. are being run with full forces.

The Perth Amboy Foundry & Machine Co., Perth Amboy, N. J., recently incorporated with a capital of $100,000 to do a foundry and machine shop business, is located at Washington street and New Brunswick avenue. The incorporators are: Peter A. Johanson, president and treasurer; Hugh Dickson, vice president; Mary L. Johanson, secretary. The company has secured a large tract of land and buildings where it will install machinery and expects to be in operation about April 1.

The Belknap Hardware & Mfg. Co., Louisville, Ky., has obtained a large contract for picks, shovels and other excavating tools, to be used in digging the Panama canal. The contract was obtained in competition with numerous other companies.

The Ohio Brass & Iron Mfg. Co., Cleveland, which recently increased its capital, does not intend to erect any buildings at present, but expects to use the new capital in extending its business. Three traveling salesmen have been added to the outside force.

The Whitman Agricultural Co., St. Louis, Mo., whose pattern building was recently damaged by fire, has not been seriously inconvenienced. The plan is now in operation as formerly.

Andrew J. Fyrberg has bought a plant at Hopkinton, Mass., and will use it in manufacturing firearms. Mr. Fyrberg was formerly head of the Fyrberg Arms Co., of Worcester, Mass., which was absorbed by Sears, Roebuck & Co., Chicago. The work of getting the plant ready for the new machinery is to be begun at once. It is expected that operations will be begun in manufacturing in a few months.

The A. S. Cameron Steam Pump Works, New York, report their February business as encouraging and the volume of orders increasing. Among the most recent installations, not including the various news items in recent issues, we learn of the following: Over a score of pumps of different sizes and types, but mostly mine pumps, for the Union Iron Works, San Francisco, Cal.; three more pumps of large capacity for use in the New York and Brooklyn tunnel at Battery Park, New York City, supplied to the Barrett Mfg. Co.; several pumps with removable bushings for pumping tar for the D. L. & W. R. R. in New Jersey; another of their large light service pumps for the Western Tube Co., duplicate of many they have in use; three of their general service pumps of different sizes for McClung & Co., Knoxville, Tenn.; three large pumps for Roy & Titcomb, Nogales, Ariz.; three general service pumps for the Oil Well Supply Co., Bradford, Pa.; a powerful pump of large capacity for the Long Mead Iron Co. for use in rolling mill; a light service pump of the removable bushing pattern for use in the navy yard at Norfolk, Va.

The business of the Fairbanks Co., in Canada, including all its selling agencies, contracts, organization and warehouse stocks at Montreal, Toronto, Winnipeg, and Vancouver, has been purchased by Henry J. Fuller, who has been the Canadian representative of the Fairbanks Co., with headquarters at Montreal. Beginning March 15, the business will be conducted as the Canada Fairbanks Co., Limited, Mr. Fairbanks being president and treasurer.

The Niles Tool Works Co., Hamilton, O., recently made a shipment of a large armor plate planer weighing 250 tons, to the Midvale Steel Co., Philadelphia.

The Niles-Bement-Pond Co. has purchased the plant formerly operated by the Cresswell-Waters Co., Nicetown, Philadelphia. The company will transform the present large foundry in Philadelphia into an erecting shop and remove the foundry equipment to Nicetown.

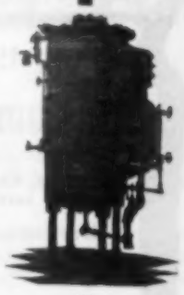
The Holyoke Cast Iron Brazing Co., Holyoke, Mass., recently organized, has obtained quarters for conducting a business of brazing metals of all kinds, especially cast iron, under a process invented by John W. Hopper, of that city.

The Star Cornice Works, Fort Worth, Texas, has moved into a spacious new building equipped with up-to-date machinery, and is prepared to do a largely increased business.

The Homestead Machine & Mfg. Co., recently incorporated at Homestead, Pa., is a reorganization of the old Homestead Machine & Mfg. Co. The directors of the company are: Lucien Dietrich, president; William Martin, secretary and treasurer; K. O. Muehlberg, Albert H. Queck, of Homestead, and Alvis Eckert, of Pittsburg. The most important product of the company is the hose coupler invented by K. O. Muehlberg.

The Helen iron furnace, owned by the Red River Furnace Co., Clarksville, Tenn., resumed operations last week after having been closed down for a year. The furnace has practically been rebuilt.

Engineering Features of Feed Water Heaters



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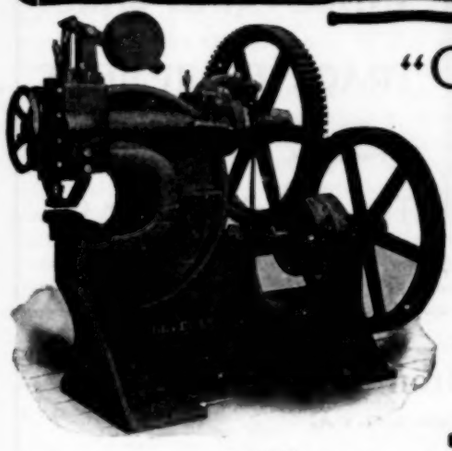

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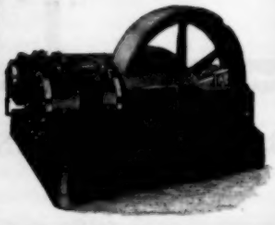

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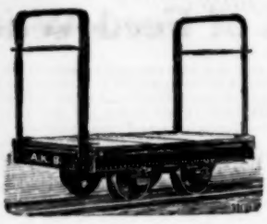

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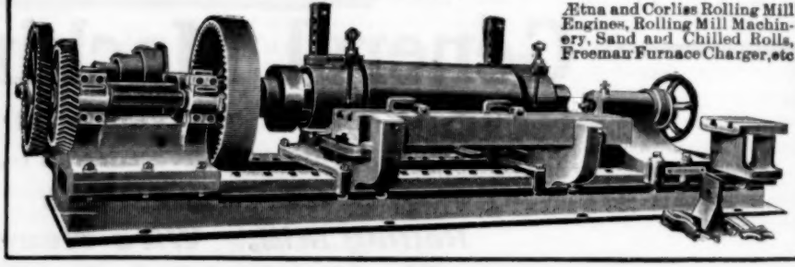

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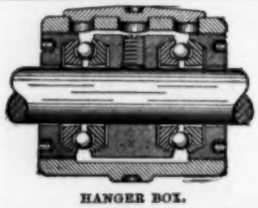

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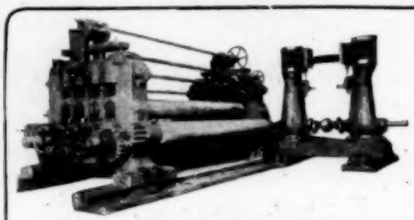

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